Vol. 912 Number 5

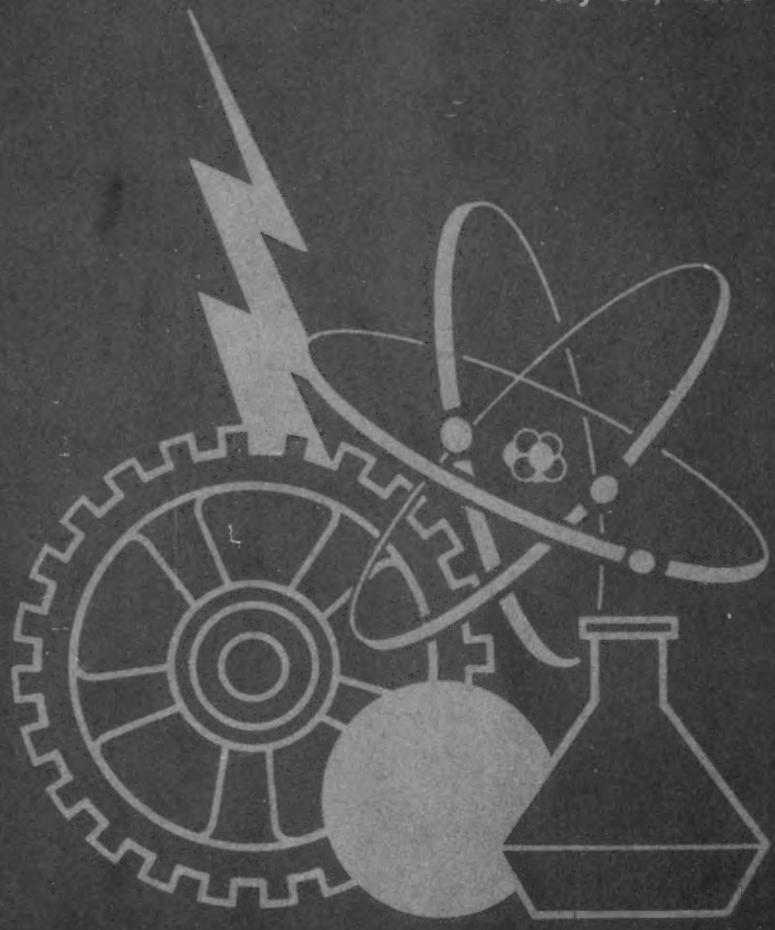
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 31, 1973



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 31, 1973 Volume 912 Number 5

CONTENTS

Page

Patents and Trademark Notices
- Board of Appeals Decisions Rendered in the Month of June 1973 1650
- Form Paragraphs and Printed Forms in Trademark Cases 1650
- Removal From Register 1650

Patent Suits 1650

Patent Notices
- Certificates of Corrections 1652
- Errata 1652
- National Technical Information Service 1652

Condition of Patent Applications 1653

Reissue Patents Granted 1654

Plant Patents Granted 1656

Patents Granted
- General and Mechanical 1657
- Chemical 1888
- Electrical 1933

Design Patents Granted 2036

Index of Patentees . . . . . PI 1

Indices of Reissues, Plants and Designs . . . . . PI 45

Classification of
- Patents (Including Reissues) . . . . . PI 49
- Designs and Plants . . . . . PI 52

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . . . PI 53
- Designs and Plants . . . . . PI 55

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of June 1973

Examiner affirmed	143
Examiner affirmed in part	11
Examiner reversed	39
Total	193

Form Paragraphs and Printed Forms in Trademark Cases

In September of 1971, the Trademark Examining Operation began utilizing form paragraphs for the purpose of accelerating the preparation and typing of first action Office letters and to increase the uniformity in the application of the Trademark Statute and the Rules by Trademark Examiners.

The form paragraphs presently total 136 and cover those objections and grounds for refusal which are commonly relied upon by Trademark Examiners in first Office actions. In some cases, the paragraphs contain blanks to be filled in by the Examiner. In addition, the Examiner may add additional sentences to the paragraphs.

The form paragraphs have been placed on magentic tapes mounted on automatic typewriters. Where the use of a form paragraph is appropriate, the Examiner identifies the paragraph to be typed by a preassigned number which is used by the typist to effect the automatic typing of the paragraph.

The Examiner may add any additional paragraphs to the letter which are not covered by an appropriate form paragraph, in which case the typist merely manually adds the paragraph to the letter.

The form paragraphs are amended from time to time to incorporate improvements in the wording as the need for such becomes apparent. Also, new paragraphs are added and old paragraphs eliminated, as experience dictates the need.

In addition, the Office has adopted a printed first action form with check-off boxes to indicate to the applicant the appropriate objection or ground of refusal in first Office actions. This form is used only where it can be used appropriately as a complete first Office action. It is not used in any case to supplement a first Office action incorporating paragraphs not encompassed by the form action. It has been found that the form action is appropriate for use in approximately 15–20% of the first actions going out of the Office.

The form first action is also designed for use as a notice of the publication of an application for opposition.

Copies of the text of the form paragraphs used with the automatic typewriters and copies of the first action form may be obtained by addressing a request for the same to the "Commissioner of Patents, Washington, D.C. 20231."

Date: June 29, 1973.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

Removal From Register

Pursuant to the provisions of Rule 347 of the Rules of Practice of the United States Patent Office in Patent Cases, a letter was directed on April 24, 1973, to Mr. Terry K. Young, % Parmelee, Miller, Welsh and Dratz, North American Rockwell Bldg., 301 5th Ave., Pittsburgh, Pa. 15222, the last post office address furnished by him to the Committee on Enrollment. No reply was received within the one month period therein set. Accordingly, his name is being removed from the Register of Attorneys and Agents.

LUTRELLE F. PARKER,
June 26, 1973. *Chairman, Committee on Enrollment.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,612,030, C. E. Ploeger, **REFRIGERATION**; **2,613,506**, D. R. Cook, **ICE-MAKING MACHINE**; **2,740,265**, J. R. Bayston, **MACHINE FOR MANUFACTURING ICE CUBES**; **2,763,993**, same, **ICE CUBE MANUFACTURING APPARATUS**; **3,000,336**, Bayston and Kuebler, **ICE MAKING MACHINE**, filed Aug. 28, 1969, D.C., S.D.N.Y., Doc. 69–3752, *Uniflow Manufacturing Co. et ano.* v. *Carleton-Stuart Corporation et al.*

2,613,506. (See 2,612,030.)

2,740,265. (See 2,612,030.)

2,763,993. (See 2,612,030.)

2,919,506, P. V. Larsen, **EXCAVATING TOOTH AND BASE SUPPORT THEREFOR**, filed Aug. 24, 1971, D.C. Md. (Baltimore), Doc. 71–912–M, *Esco Corporation* v. *The Tru-Rol Co. Inc.* Decision: Plaintiff is owner; claims 1, 3, 8, 15, 20, 21 and 28 valid. Defendant has infringed; defendant enjoined, Jan. 3, 1973.

2,967,997, R. D. McCoy, **METHOD AND APPARATUS FOR CHECKING ELECTRONIC ANALOG COMPUTERS**, filed Apr. 5, 1966, D.C.N.J. (Newark), Doc. 345–66, *Reeves Instrument Co.* v. *Electronic Associates Inc. et al.* Decision: Stipulation and order of dismissal of action, Jan. 11, 1973.

3,000,336. (See 2,612,030.)

3,018,500, J. W. Anderson, **WINDSHIELD WIPER BLADE**; **3,372,423**, same, **WINDSHIELD CLEANER**, filed Dec. 26, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c3238, *The Anderson Co.* v. *The Gates Rubber Co.*

3,104,799, D. J. Steidinger, **ENVELOPE ASSEMBLY**, filed June 15, 1971, D.C., E.D. Mich. (Detroit), Doc. 36658, *Perry Printing Co.* v. *Uarco, Inc.* Ordered, adjudged and decreed, patent valid, claims 1 to 6, 10 to 12 and 18 thereof, have been infringed by plaintiff. Plaintiff permanently enjoined, Jan. 9, 1973.

3,147,904, L. P. Larson, **DISPENSING CARTON WITH RECLOSABLE POUR SPOUT**, filed June 14, 1971, D.C., E.D. Mich. (Detroit), Doc. 36652, *Riegel Paper Corp.* v. *Ex-Cell-O Corp.* Decision: Consent judgment for permanent injunction, May 5, 1972.

3,182,289, R. R. Rossi, **WARNING LIGHT CONTROL SYSTEM**, filed June 16, 1971, D.C.N.J. (Trenton), Doc. C–896–71, *Arrow Safety Device Company* v. *Nassau Fastening Co. and Emanuel Mendelsohn and Carol Brown, doing business as School Bus Parts Co.* Judgment dismissing action in favor of defendants and against plaintiff, Jan. 24, 1973.

3,200,149, Blackwood, Hennhard, Beereboom, and Stephens, **TETRACYCLINE DERIVATIVES AND PROCESS**, filed Jan. 10, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–58–R, *Pfizer Inc.* v. *International Rectifier Corporation et al.*

3,247,747, Fuesslein, Rader, and Roper, **METHOD OF SEALING TUBING**, filed Sept. 12, 1972, D.C., E.D. Pa. (Philadelphia), Doc. 68–1996, *Mueller Brass Co.* v. *Reading Industries Inc.* Decision: Judgment entered for defendant and against plaintiff in plaintiff's claim for infringement of patent. Judgment entered for Reading Inc. on counterclaim of Mueller Brass Co. for a declaratory judgment that claims 1 thru 4 including patent are invalid, said claims are declared invalid, Dec. 22, 1972.

3,282,057, A. D. Prosser, **UNDERGROUND LINE AND METHOD OF INSTALLING SAME**, filed June 12, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1426, *Gordon H. Allen et al.* v. *W. H. Brady Co.* Memorandum opinion filed, judgment order entered, Dec. 26, 1972.

3,293,094, Nairn, Harkins, Ehrenfeld, and Tarlow, **TEXTURED FOAM PRODUCTS**; **3,293,108**, same, filed Jan. 4, 1973, D.C., E.D. Pa. (Philadelphia), Doc. 73–18, *Armstrong Cork Company* v. *Congoleum Industries Co.*

3,293,108. (See 3,293,094.)

3,312,477, G. Brown, **TRANSPARENT BANK CONSTRUCTION HAVING COIN SORTING MEANS**, filed Jan. 16, 1973, D.C., N.D. Ill. (Chicago), Doc. 72c128, *Superior Toy & Mfg. Co., Inc.* v. *M. Pressner & Co. et al.*

3,377,230, Wachtell and Sellig, DIFFUSION COATING FOR METALS, filed Dec. 2, 1968, D.C. Del. (Wilmington), Doc. C-3640, *Chromalloy American Corporation* v. *Alloy Surfaces Co., Inc. and George H. Cook.* Final judgment entered in defendants favor against the plaintiff declaring patent invalid because plaintiff in violation of 35 U.S.C. § 102(b) placed the U process "on sale" in this country more than one year before the plaintiff applied for patent and also to be unenforceable because during prosecution of the patent in the Patent Office the applicants failed to disclose material information which amounted to misrepresentations transgressing equitable standards of conduct owed to the public in return for the patent monopoly. Judgment entered in the defendants favor against the plaintiff, Jan. 22, 1973.

3,372,423. (See 3,018,500.)

3,377,568, Kruse, Storke, and Baskins, VOLTAGE TUNED OSCILLATOR; 3,397,365, Kruse and Baskins, OSCILLATOR WITH SEPARATE VOLTAGE CONTROLS FOR NARROW AND WIDE RANGE TUNING, filed Feb. 8, 1971, D.C. Ariz. (Phoenix), Doc. C-71-86, *Kruse Electronics* v. *Omni Spectra Inc.* Decision: Upon consent of parties, ORDER that this action is dismissed with prejudice, Jan. 11, 1973.

3,397,365. (See 3,377,568.)

3,408,572, F. C. Marino, CONTROLLED AMPLITUDE FREQUENCY SHIFT SIGNAL GENERATOR; 3,472,448, Wolf, Marino, Simon and Kummer, RECORDING SYSTEM FOR BUSINESS MACHINES, filed Dec. 24, 1969, D.C.N.J. (Newark), Doc. C-1533-69, *Digitronics Corp.* v. *Marketing Systems, Inc.* Stipulation and order of dismissal of action, Jan. 26, 1972.

3,454,100, M. R. Lilley, WINDROWING FORK ARRANGEMENT FOR PEANUT DIGGER, filed Jan. 10, 1973, D.C., N.D. Ga. (Atlanta), Doc. 17656, *Ferguson Manufacturing Company Inc.* v. *Kelley Manufacturing Company.*

3,463,317, W. R. Prier, ADAPTER UNIT FOR A FLUID FILTER AND FLUID COOLER, filed Jan. 12, 1973, D.C., N.D. Okla. (Tulsa), Doc. 73-C-10, *Thermo-Chem Corporation* v. *General Motors Corporation et al.*

3,472,448. (See 3,408,572.)

3,484,888, M. C. Davis, COMBINED FLOOR WIPER AND SCOURER APPARATUS, filed Apr. 13, 1970, D. C., E.D. Mich. (Detroit), Doc. 34729, *Drackett Co. and Bristol-Myers Co.* v. *Mack C. Davis.* Patent invalid, Jan. 9, 1972.

3,487,947, E. M. Bogar, Jr., FISHING ROD HOLDER, filed Jan. 12, 1972, D.C., E.D. Mich. (Detroit), Doc. 39497, *Earl M. Bogar, Jr.* v. *Detroit Marine Engineering Corporation.*

3,496,911, A. Chmelar, ELECTROSTATIC FLOCKING; 3,551,178, same, METHOD AND APPARATUS FOR ELECTROSTATIC FLOCKING, filed Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16204, *Velvetex Industrial Corp.* v. *Evershine Products Inc.* Decision: Dismissed action without prejudice to the right upon good cause shown within 60 days to reopen this action, Jan. 12, 1973.

3,521,412, R. W. McCarty, METHOD OF HONING BY EXTRUDING; 3,634,973, same, APPARATUS FOR ABRADING BY EXTRUSION AND ABRADING MEDIUM, filed Dec. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C-72-1328, *Extrude Hone Corp.* v. *Lear-Siegler, Inc.*

3,542,986, E. J. Kotski, QUICK-MAKE, QUICK-BREAK ACTUATOR FOR HIGH VOLTAGE ELECTRICAL CONTACTS, filed Jan. 11, 1973, D.C., N.D. Ohio (Cleveland), Doc. C-73-29, *General Electric Company* v. *Joy Manufacturing Company.*

3,551,178. (See 3,496,911.)

3,594,255, W. D. Budinger, HICKEY ROLLER AND METHOD, filed Sept. 20, 1971, D.C. Del. (Wilmington), Doc. 4227, *Rodel Inc. and William D. Budinger* v. *National Plate Graining Inc.* Decision: Stipulation of dismissal pursuant to Rule 41(a)(1) of the Federal Rules of Civil Procedure, Jan. 15, 1973.

3,611,910, J. S. Hughes, CORN POPPER; D. 206,674, Hughes and Cleminshaw, same, filed Jan. 5, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c61, *Robeson Cutlery Co. Inc.* v. *Reliable Mfg. Co. Inc.*

3,634,973. (See 3,521,412.)

3,635,472, W. Marcyan, SINGLE STATION MULTI-PURPOSE BODY EXERCISING MACHINE; Reg. No. 887,447 (MARCY), Marcy Gymnasium Equipment Co., filed Jan. 10, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73-47-CC, *Walter Marcyan and Marcy Gymnasium Equipment Co.* v. *Steve J. Yatso, doing business as Steve's Gymnasium Equipment Mfg.*

3,695,891, W. F. Fox, METHOD OF TREATING SOYBEANS, filed Jan. 19, 1973, D.C., S.D. Iowa (Des Moines), Doc. 73-10-1, *Kochring Company* v. *Triple "F" Inc.*

D. 202,172, R. Paulich, DOOR KNOCKER, filed Aug. 18, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-1910-R, *Columbia Specialty Company Inc.* v. *Personally Yours Corp., Charles A. Larrain and Donald McLean.*

D. 206,674. (See 3,611,910.)

Reg. No. 887,447. (See 3,635,472.)

Certificates of Correction

The list of Certificates of Correction for July 31, 1973 will appear in the OFFICIAL GAZETTE of August 7, 1973.

Errata

All reference to Patent No. 3,684,314 to Lloyd A. Molby of Longview, Tex., for Adjustable Ball Pin Pivot, appearing in the OFFICIAL GAZETTE of Aug. 15, 1972, should be deleted since no patent should have been granted.

All reference to Patent No. 3,683,195 to Karl-Heinz Johannsmeier of Mountain View, Calif.; Paul E. Stoft of Menlo Park, Calif.; and Tor G. Larsen, Cupertino, Calif., for Apparatus for the Automatic Alignment of Two Superimposed Objects, e.g., a Semiconductor Wafer and Mask, appearing in the OFFICIAL GAZETTE of Aug. 8, 1972, should be deleted since no patent should have been granted.

All reference to Patent No. 3,687,834 to James T. Candor of Dayton, Ohio, for Method and Apparatus for Removing Particles from Fluid Containing the Same, in the Errata appearing in the OFFICIAL GAZETTE of Dec. 5, 1972 (905 O.G. 4), should be deleted as the patent was correctly issued on Aug. 29, 1972.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The invention listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of Patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the PAT-APPL number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. ATOMIC ENERGY COMMISSION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 157,139. Method for Measuring the Amount of Cold Working in a Stainless Steel Sample. Filed June 28, 1971. PC $3/MF $0.95.

Patent 3,678,446. Coaxial Cable Connector. Filed June 2, 1970. Patented July 18, 1972. Not available NTIS.

Patent 3,698,890. Aluminum Alloy. Filed Aug. 13, 1970. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,701,061. Radiofrequency Window Assembly Having Shielded Solder Joints and Reweldable Replacement Flanges. Filed Oct. 20, 1970. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,702,420. Electrical Surge Diverting Connector. Filed Dec. 21, 1971. Patented Nov. 7, 1972. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 354,099. A Topical Agent for Control of Post-Burn Evaporative Water and Calorie Losses. Filed Apr. 24, 1973. PC $3/MF $1.45.

Patent 3,726,597. Controlled Environment Culture System for Light Microscopy. Filed Mar. 9, 1972. Patented Apr. 10, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent 3,730,781. Method of Improving Creep-Resistance of Alloys. Filed Dec. 8, 1971. Patented May 1, 1973. Not available NTIS.

Patent 3,729,306. Purification of Rare-Earth Metals. Filed Apr. 28, 1969. Patented Apr. 24, 1973. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP-2, Washington, D.C. 20546

Patent application 350,250. Refractory Porcelain Enamel Passive Thermal Control Coating for High Temperature Alloys. Filed Apr. 11, 1973. PC $3/MF $1.45.

[FR Doc. 73-14025; Filed 7-10-73; 8:45 am]

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 7, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-30-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-01-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-03-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-24-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-01-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-29-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-16-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-23-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-13-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	7-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-02-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-16-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-15-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-03-72

Expiration of patents: The patents within the range of numbers indicated below expire during July 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,752,595 to 2,757,377, inclusive
Plant Patents..... Numbers 1,492 to 1,504, inclusive

REISSUES

JULY 31, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,711

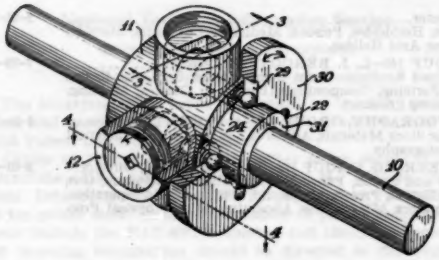
CONTROLLABLE MOTION AND FORCE CONVERTER

James P. Steibel, Sturtevant, Wis., assignor to The Dumore Company, Racine, Wis.

Original No. 3,475,972, dated Nov. 4, 1969, Ser. No. 809,462, Mar. 7, 1969, which is a continuation of Ser. No. 706,063, Feb. 16, 1968, which in turn is a continuation-in-part of Ser. No. 628,678, Apr. 5, 1967, both now abandoned. Application for reissue Apr. 6, 1970, Ser. No. 26,180

Int. Cl. F16h *21/16*

U.S. Cl. 74—25 13 Claims



A device for converting a torque force into a linear force directed parallel to the axis of the torque force comprising a rotatable shaft onto which a torque force is applied, a housing surrounding the shaft, the housing including a plurality of bearings each having its outer race peripherally engaging the periphery of the shaft, to be rotatably driven by said shaft about their own axes but being movable axially of the shaft, bearing pivot means for pivoting each bearing about an axis that is perpendicular to both the axis of the bearing and the axis of the shaft, so that a force component is transmitted from the shaft to the bearing which is manifested by development of a force parallel to the axis of the shaft which tends to effect relative movement between the shaft and frame in directions axially of the shaft, and a controller means for selectively effecting substantially identical pivoting of all bearings simultaneously.

27,712

POWER TRANSMISSION

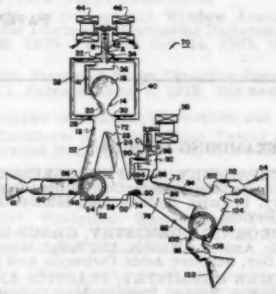
Kenneth F. Becker, Clarkston, Le Roy D. Taylor, Rochester, and Walter J. Zoya, Troy, Mich., assignors to Sperry Rand Corp., Troy, Mich.

Original No. 3,521,653, dated July 28, 1970, Ser. No. 690,176, Dec. 13, 1967. Application for reissue Jan. 4, 1971, Ser. No. 103,657

Int. Cl. F15c *3/06*

U.S. Cl. 137—831 4 Claims

A fluid directional control device having in combination a fluid amplifier for directing fluid flow to one of a plurality of fluid outlets and a movable ball element which is responsive to pressure acting thereon to prevent fluid flow from exhausting from the other of said plurality of



fluid outlets when said fluid flow is exhausted from said one outlet[.] *and to provide feedback flow to improve stability.*

27,713

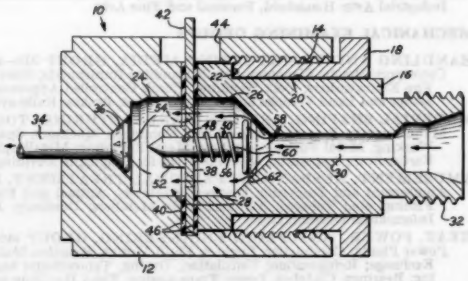
FLOW ACTUATED PIN CONTACT SWITCH

Arthur D. Clauson, La Grange, Ill., assignor to Sun Electric Corporation

Original No. 3,548,133, dated Dec. 15, 1970, Ser. No. 787,934, Dec. 30, 1968. Application for reissue Nov. 26, 1971, Ser. No. 202,707

Int. Cl. H01h *35/40*

U.S. Cl. 200—81.9 R 18 Claims



A fluid flow transducer responsive to the pulsating flow of fuel in a fuel injection system comprises a housing having a conductive plate mounted therein and a reciprocating pin moveably carried on the plate. Between fuel flow pulses, the pin contacts the housing to complete an elec-

trical circuit between the housing and plate and when a fuel pulse occurs, the pin is reciprocally urged out of contact with the housing to open the circuit.

27,714

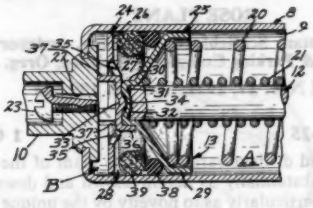
PNEUMATIC DOOR CLOSER

Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corp., St. Paul, Minn.

Original No. 3,593,367, dated July 20, 1971, Ser. No. 850,578, Aug. 15, 1969. Application for reissue Mar. 1, 1972, Ser. No. 231,036

Int. Cl. E05f 3/00

U.S. Cl. 16—66 8 Claims



Piston means in a pneumatic door closer and including a body structure defining a radially outwardly opening annular channel having axially spaced sidewalls, a sealing ring movable axially toward and away from one of the sidewalls, and a porous lubricating ring disposed between the other of the sidewalls and the sealing ring. Both rings frictionally engage the cylindrical surface of an elongated casing in which the piston means is axially movable. The piston means includes a pair of cooperating elements welded together and to the inner end of a plunger rod which extends axially outwardly of one end of the casing.

27,715

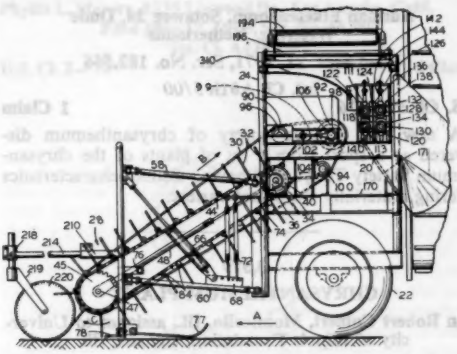
PICKLING CUCUMBER HARVESTER

Wellington W. Porter, R.D. 2, Dublin Road, Waterloo, N.Y. 13165

Original No. 3,518,818, dated July 7, 1970, Ser. No. 700,175, Jan. 24, 1968. Application for reissue July 5, 1972, Ser. No. 260,135

Int. Cl. A01d 45/00

U.S. Cl. 56—327 5 Claims



Pickling cucumber harvester having a transverse ground level vine cutter and sprocket and chain tines for sweeping cut vines upon conveying belts in a wide swath, the tines receding between the belts, a pair of stripping rolls, backed up by a pair of traction rolls disposed to pull the vines from the conveyor belts, and the lower of the separating rolls being smooth, and the traction and separator rolls having a peripheral velocity in the order of five times the conveyor belt speed to suddenly accelerate the vines, and thin them out so that the spacing between the separating rolls is close and whereby the pickling cucumbers are detached and prevented from passing between the separating rolls.

PLANT PATENTS

GRANTED JULY 31, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,378

CHRYSANTHEMUM PLANT

Adriaan Eikelenboom, Sotaweg 24, Oude Wetering, Netherlands

Filed Sept. 21, 1971, Ser. No. 182,566

Int. Cl. A01h 5/00

U.S. Cl. Plt.—76 1 Claim

A new and distinct variety of chrysanthemum discovered as a sport from a lot of plants of the chrysanthemum variety Tokyo, but having distinct characteristics differing materially from that variety.

3,379

CHRYSANTHEMUM PLANT

John Robert Culbert, Monticello, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Sept. 30, 1971, Ser. No. 185,457

Int. Cl. A01h 5/00

U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of chrysanthemum plant substantially as herein shown and described, characterized particularly as to novelty by pure spoon tipped daisy flowers 1¾" to 2¼" in diameter, plants that average 5 to 7 breaks per pinched plant, a prolific flowering habit in that well grown spray type six inch pots with 5 cuttings will produce 80 to 100 flowers, and efficient reproduction characteristics requiring only 9 to 10 weeks total crop time.

3,380

ROSE PLANT

Reimer Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 15, 1971, Ser. No. 189,679

Int. Cl. A01h 5/00

U.S. Cl. Plt.—25 1 Claim

1. A new and distinct variety of azalea characterized particularly as to novelty when compared to the cultivar Pluto by its large semi-double to double flowers averaging 4" or more in diameter, a light pastel pink color with a creamy colored blotch, large glossy, waxy foliage, ability to be held for late April flowering in a natural season program, flowering in terminal clusters giving a cut flower arrangement-like effect, heavier, stronger stems, and fewer breaks or shoots.

3,381

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 15, 1971, Ser. No. 189,680

Int. Cl. A01h 5/00

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combinations of a tall, vigorous, well branched plant, freely borne flowers of Cardinal red aging to Rose Madder in color, and foliage extremely resistant to attack by rose powdery mildew.

3,382

ROSE PLANT

Mathias Tantau, Schliebfach, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 17, 1971, Ser. No. 199,506

Int. Cl. A01h 5/00

U.S. Cl. Plt.—25 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, bushy, fast repeating habit of growth, leathery foliage, medium size, double flowers of a bronze-gold/orange color, outstanding as a medium sized cutflower.

3,383

ROSE PLANT

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to Carlton Rose Nurseries, Carlton, Oreg.

Filed Feb. 23, 1972, Ser. No. 228,779

Int. Cl. A01h 5/00

U.S. Cl. Plt.—29 1 Claim

A rose plant of the floribunda class for greenhouse use as cut flowers, originated by crossing, as a seed parent, an unnamed seedling which was a cross between Mandrina, as a seed parent with Baccara (Plant Patent No. 1,367), as a pollen parent, which first-named seedling was crossed on an unnamed seedling as a pollen parent, which latter was also a cross between Mandrina, as a seed parent on Baccara (Plant Patent No. 1,367), as a pollen parent.

3,384

AZALEA PLANT

Steve Coutrakis, 929 W. Main St., Ripon, Calif. 95366

Filed Apr. 24, 1972, Ser. No. 247,194

Int. Cl. A01h 5/00

U.S. Cl. Plt.—56 1 Claim

An azalea plant—of the Belgian Indica class, and of greenhouse forcing and garden type readily reproduced by cuttings—which is dense, bushy, well branched but symmetrical, and foliated with oval, heavy textured, glossy but very slightly pubescent, medium size leaves of medium green color on the top side, and lighter green on the under side; the plant blooming profusely and substantially evenly over the entire plant, with large, persistent, hose in hose, with some double, bright pink flowers having velvety petals slightly ruffled at the edges, and the flowers being borne in clusters of two to eight held relatively high above the foliage by strong medium length stems.

PATENTS

GRANTED JULY 31, 1973

GENERAL AND MECHANICAL

3,748,657

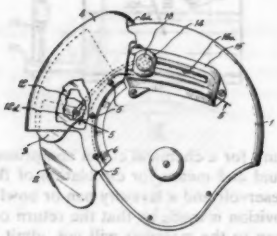
SAFETY HELMET WITH RETRACTABLE EYE SHIELD

Jackson A. Aileo, Carbondale, Pa., assignor to Bentex Corporation, Carbondale, Pa.

Division of Ser. No. 609,827, Jan. 17, 1967, Pat. No. 3,495,273. This application July 18, 1969, Ser. No. 842,893

Int. Cl. A42b 3/00

U.S. Cl. 2—6 **5 Claims**



A safety helmet including a shell to cover the wearer's head, and one or two eye shields mounted on the shell and movable between eye shielding positions and retracted positions. Handles for actuating the shields are located at the sides of the helmet. Releasable locking mechanisms for the shields include push buttons on the handles for releasing the locks.

3,748,658

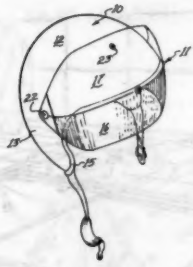
DUPLEX VISOR

Richard W. Albright, 11060 McBroom St., Sunland, Calif.

Filed Aug. 9, 1971, Ser. No. 170,125

Int. Cl. A61f 9/04

U.S. Cl. 2—10 **5 Claims**



An improved duplex visor for a helmet, the visor having a transparent clear portion and a transparent light attenuating portion. The visor is adapted to be pivotally moved from a position in the field of vision of the wearer to a position in spaced conformity to the crown of the helmet and further adapted to be easily rotated, whereby either the clear or the attenuating portions can be positioned in the field of vision in order to accommodate a full range of light conditions.

3,748,659

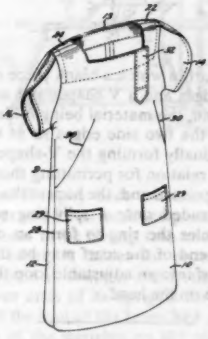
SCRUB DRESS

Phyllis L. Meyers, 5235 Linwood Dr., Los Angeles, Calif.

Filed June 17, 1970, Ser. No. 46,907

Int. Cl. A41d 1/22

U.S. Cl. 2—74 **5 Claims**



A scrub dress for use by women of varying physical dimensions. The scrub dress is straight-sided without utilizing a waist line so as to obtain greater comfort and better lines for women of varying shapes. A square neck opening is employed which will fit any size neck comfortably. Easy entry to the dress is made possible by a vertical slit that extends downwardly from one side of the neck opening. The slit is closed by releasable means of flat shape that permit easy laundering and ironing with a power mangle. The sleeves are so proportioned as to permit freedom of arm movement.

3,748,660

MINIATURE HATS

Engelbert J. Peham, St. Paul, Minn., assignor to Peham Plastics, Inc., St. Paul, Minn.

Filed Mar. 17, 1971, Ser. No. 125,102

Int. Cl. A42b 7/00

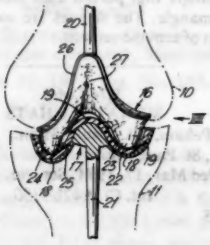
U.S. Cl. 2—175 **2 Claims**

A plastic miniature hat is provided with a plug of paperboard or the like in spaced relation to the hat crown. A hat securing cord is attached to the plug. The plug is slotted to admit coins so that the hat may serve as a coin bank.

3,748,661
ADJUSTABLE SCARF
Janet L. Smith, 39380 Monterey Way, Fremont, Calif.
Filed Oct. 12, 1971, Ser. No. 187,975
Int. Cl. A42b 5/00
U.S. Cl. 2—207 1 Claim

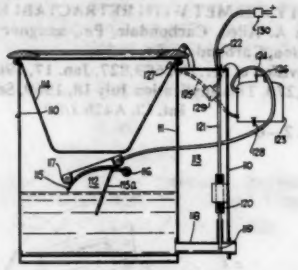
An adjustable scarf in which a blank piece of scarf material has parallel side edges and a V-shaped cut at one end and a hem at the other end, the material being folded along a median line paralleling the two side edges so as to align the two inclined edges originally forming the V-shaped cut and bring them into abutting relation for permitting them to be stitched together to form a pointed end, the hem at the other end of the material being threaded onto a split ring so that the hem receives and encircles the ring to form an opening through which the pointed end of the scarf may be threaded through for forming the scarf into an adjustable loop that may encircle the neck or be worn on the head.

3,748,662
REPLACEMENTS FOR BICONDYLAR JOINTS IN HUMAN LIMBS
Arthur Jacob Helfet, "Summerhill", Bebington Ave., Cape Town, Republic of South Africa
Filed Apr. 21, 1972, Ser. No. 246,448
Claims priority, application Great Britain, Apr. 21, 1971, 10551/71
Int. Cl. A61f 1/24, 1/04
U.S. Cl. 3—1 8 Claims



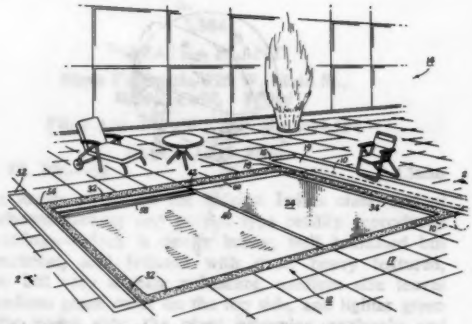
A surgical prosthesis or implant for replacing the natural components of a bicondylar joint in a human limb (leg or arm). Thus, a natural knee or elbow joint consists of two pairs of coacting load-bearing condyles. The prosthetic implant has two pairs of coacting male and female condylar components. The male and female components which replace the natural lateral condyles are spherical or spheroidal in shape to simulate a ball and socket joint, while the male and female components which replace the natural medial condyles are constituted by a rib or ridge and a groove. Both the rib and the groove are curved, in a plane normal to the general axis of the limb when straight or extended, to an arc of a circle centered on the center of articulation of the ball and socket, and are also curved in a plane parallel to the limb, the radius of the crest of the rib being less than the radius of the coacting base of the groove. Both male components and both female components can be formed on respective rigid carriers, or they may optionally be separate for individual fixation to the patient's limb.

3,748,663
CHEMICAL CLOSETS
Montague Hiller, 20 Carrington Ave., Borehamwood, Hertfordshire, England
Filed Mar. 8, 1971, Ser. No. 121,839
Int. Cl. A47k 11/02; A61l 11/00
U.S. Cl. 4—115 11 Claims



A flushing unit for a chemical closet comprises a reservoir for flushing fluid and means for circulation of flushing fluid between the reservoir and a lavatory pan or bowl of a chemical closet. Provision is made so that the return conduit from the lavatory pan to the reservoir will not admit at any time solid material deposited in the lavatory pan. Passage of liquid deposited in the lavatory pan therefrom to the reservoir is generally prevented by ensuring that the return conduit is incapable of allowing the free flow therethrough of liquid except during transfer of flushing fluid to the lavatory pan or chamber. The return conduit can take the form either of a narrow bore tube through which liquid can only be passed under suction, or can be of wider bore having a suitable valve therein.

3,748,664
SYSTEM FOR MAINTAINING ACCEPTABLE ENVIRONMENTAL CONDITIONS IN AN INDOOR SWIMMING POOL ENCLOSURE
Akio Morita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 13, 1971, Ser. No. 207,154
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.14 6 Claims



A buoyant sheet material and apparatus utilizing the material are disclosed for preventing evaporation of water in an indoor swimming pool when the pool is not in use. The sheet material is formed with a layer of buoyant foamed plastic material and a thinner layer of water-impervious plastic material and it is wound on a roll rotatably mounted adjacent

one side of the pool. When the pool is not in use, the sheet material is drawn from the roll and placed on the surface of the water in the pool to prevent evaporation of the water and to thereby maintain a relatively low humidity in the pool enclosure.

3,748,665

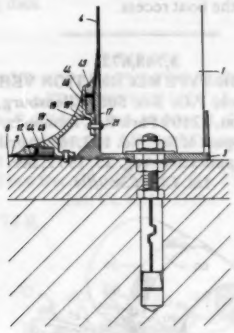
SWIMMING POOL

Hans Viessmann, Battenberg/Eder in Hain, Germany

Filed Apr. 24, 1972, Ser. No. 247,093

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.19 **4 Claims**



A swimming pool construction having improved means for initially waterproofing adjoining sections of pool liners as well as to simplifying repair of damaged areas of joinder is disclosed. In pools of this general type bottom and side wall waterproof liners are held in position and rendered waterproof by shaped moldings clamped thereagainst. The invention simplifies installation and repair by providing the shaped moldings with ledges spaced from the pool walls or bottom to provide grooves or openings therebetween to receive edges of liners, sealing strips and sealing compound.

3,748,666

BEDS

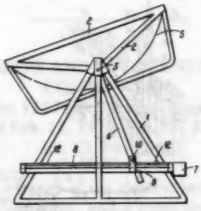
Koh Chuan Seng, No. 24, Jalan Pokok Serunai, Singapore

Filed Aug. 5, 1971, Ser. No. 169,184

Claims priority, application Great Britain, Aug. 6, 1970, 38,018/70

Int. Cl. A61g *7/10*

U.S. Cl. 5—61 **10 Claims**



A bed for patients who are unable to move about in bed to prevent sores comprises an elongate carrier structure having a web of flexible sheet material hung across it and power-drivable means for turning the carrier structure to and fro so as to cause different parts of the patient's anatomy to support his weight.

3,748,667

CONVERTIBLE PIECE OF FURNITURE WITH DOUBLE-DECKER BEDS

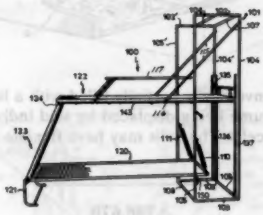
Bernard Ract, Albertville, France, assignor to Juvenilia, Albertville, France

Filed Mar. 29, 1971, Ser. No. 128,674

Claims priority, application France, Apr. 7, 1970, 7012475

Int. Cl. A47c *19/00*

U.S. Cl. 5—8 **5 Claims**



Double-decker Murphy beds mounted in a wardrobe or closet. The upper and lower beds are pivotally mounted in the wardrobe or closet to be swung into and out of it independently of each other. A ladder for providing access to the upper bed is pivoted at its upper end on the upper bed and has slots in the lower ends of its uprights for receiving threaded pins provided at the foot of the lower bed ; wing nuts maintain the lower ends of the uprights on the pins. A spring-biased latching bolt is mounted on the upper bed to maintain it in its horizontal position and is operable by a cable extending along the length of the bed-spring thereof. Springs are provided for facilitating the return of the lower bed into the wardrobe.

3,748,668

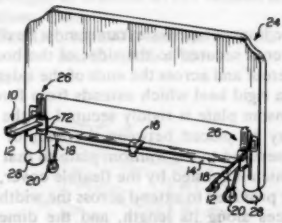
HEADBOARD CONNECTOR ASSEMBLY FOR BEDS

Louis Rudin, 1876 E. 21st St., Brooklyn, N.Y.

Filed Mar. 26, 1969, Ser. No. 810,515

Int. Cl. A47c *19/00, 23/00*

U.S. Cl. 5—296 **10 Claims**



A hook construction for connecting the frame of a bed to a headboard. The hook structure is detachably connected to the frame of the bed by connections which provide for adjustment of the headboard to touch the floor or adjustment to various heights which permit the bed frame to be moved on its casters without having the legs of the headboard touch the floor. The hook assembly is also adjustable to accommodate headboards of different width and/or to accommodate adjustments in the transverse width of the bed frame.

3,748,669

LIGHTWEIGHT BODY SUPPORTING STRUCTURE

Frederick L. Warner, 6927 Harbor Ln., Fort Myers, Fla.

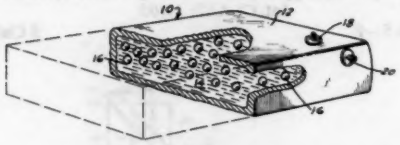
Filed Aug. 11, 1971, Ser. No. 170,686

Int. Cl. A47c *27/08*

U.S. Cl. 5—348 WB **4 Claims**

A lightweight body supporting structure having a fluid medium for use as a mattress, bed or the like comprising a

flexible, fluid impermeable envelope and a plurality of individual fluid impervious cells disposed within said envelope, each cell containing a gaseous substance or totally void of



matter. The envelope is partially filled with a liquid, with the remaining volume being displaced by said individual gaseous filled or void cells. The cells may have flexible or rigid boundaries.

3,748,670

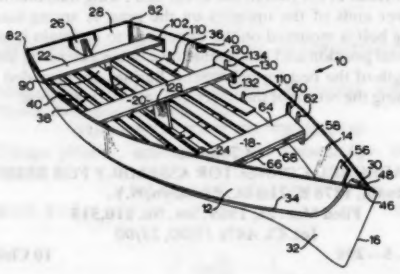
FOLDABLE BOAT

William F. J. Musson, 391 Sentinel Rd., Apt. 118, Downsview, Ontario, Canada

Filed May 28, 1971, Ser. No. 147,761

Int. Cl. B63b *7/06*

U.S. Cl. 9—2 C **4 Claims**



A foldable boat comprises a frame and a flexible cover. The flexible cover is secured to the sides of the boat and around the nose thereof and across the ends of the sides; and it is also secured to a rigid keel which extends from fore to aft of the boat. A transom plate is rigidly secured to the keel, and the transom may be placed between the ends of the sides and lifted to be secured to the transom plate so that the bottom of the boat, which is formed by the flexible cover, is contoured. Thwarts are provided to extend across the width of the boat at various places along its length, and the dimensions of the thwarts govern the sideways spacing between the sides of the boat at those places. Floorboards are supported by the rigid keel and by supporting lugs at the lower edges of the side members, and serve to maintain the sideways spacing of the lower edges of the sides.

3,748,671

INFLATABLE BOAT COVER, FOR PNEUMATIC BOATS, SUITABLE TO ALLOW THE BOAT TO BE TOWED IN ITS CAPSIZED POSITION

Giacomo Dusmet, No. 50 Lungotevere degli Inventori, Rome, Italy

Filed July 19, 1971, Ser. No. 163,686

Claims priority, application Italy, Oct. 27, 1970, 54342 A/70; Nov. 25, 1970, 54970 A/70

Int. Cl. B63b *7/08*

U.S. Cl. 9—2 A **8 Claims**

An inflatable boat cover, for pneumatic boats, suitable to allow the boat to be towed in its capsized position consisting of a sheet of waterproof and flexible material, watertight fixed throughout the edge of the inner recess of the boat, inflatable

so as to form an auxiliary upper keel and to prevent the water from entering into the boat recess.

3,748,672

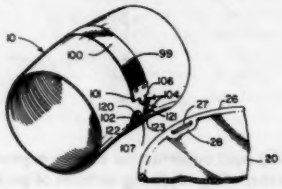
INNER TUBE-TYPE RECREATION VEHICLE

Archibald S. Patrick, P.O. Box 506, Ellensburg, Wash., and Robert G. Johnson, 22109 Park Rd., Edmonds, Wash.

Continuation-in-part of Ser. No. 133,169, April 12, 1971, abandoned. This application Aug. 23, 1971, Ser. No. 174,012

Int. Cl. B63c *9/04*

U.S. Cl. 9—347 **6 Claims**



An inner tube-type recreation vehicle is described having a torus inflatable tube with a seat secure at a desired elevation in the central opening of the tube. The seat is secured to the tube by a plurality of strap assemblies at angularly spaced locations about the tube.

3,748,673

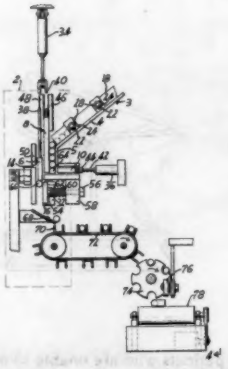
APPARATUS FOR PRODUCING ANCHOR BOLTS

Malcolm W. Anderson, Columbiana, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Feb. 1, 1971, Ser. No. 111,506

Int. Cl. B21k *1/44*; **B23g** *9/00*; **B21h** *3/04*

U.S. Cl. 10—11 R **2 Claims**



A completely automatic system for converting plain metal rods into anchor bolts with a thread on one end and an approximate right angle bend on the other all complete with au-

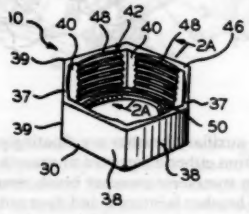
tomatic feeding of the work pieces through the system and into a shipping container; the system comprising an in-feed mechanism to a roll threader, a roll threader, rod guide means for holding each rod as it is being threaded in aligned position with the rod threading dies with the proper amount of force, conveying means from the roll threader into a bending mechanism, a bending mechanism, a conveying mechanism from the bending mechanism to a shipping or storage container; and wherein the in-feed mechanism includes means for selecting one rod at a time to be placed in the rod guide means which includes a pair of timed vertically reciprocating bars moving parallel with the threading dies, with one of the pair of reciprocating bars acting as a means for pushing said rod to be threaded into the rod guide means and subsequently into the roll threading dies.

3,748,674

METHOD AND APPARATUS FOR MAKING HEX NUTS FROM SHEET METAL

James C. Powell, Elkhart, and Andrew S. Treber, South Bend, both of Ind., assignors to All-Steel Equipment Inc., Aurora, Ill.

Filed Dec. 27, 1971, Ser. No. 212,130
Int. Cl. B21d *53/24*
U.S. Cl. 10—72 R **6 Claims**



A method and apparatus for making, from sheet metal, hex nuts for electrical fittings in which a twelve sided planar nut blank is stamped from a strip of sheet metal, and is subjected to two successive drawing steps that provide the basic exterior configuration of the nut in the form of a bottom wall with an upstanding hex shaped side wall terminating in a marginal edge portion, after which the end of the marginal edge portion is flattened and simultaneously the inner surfaces of the nut are countersunk for application of threading thereto and trademark indicia and the like are formed in the opposite end of the nut; the nut blank marginal edge portion is then deburred, after which the nut is punched to form the full throat of the nut, and then the margin of the throat inside the nut is press formed to define the nut gland engaging surface. The nut blank is then tapped and barrel plated.

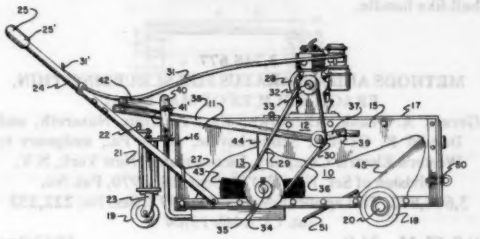
3,748,675

SNO-THROW AND PAVEMENT CLEANER COMBINATION

Donald W. Schultz, 12724 E. Sprague, Opportunity, Wash.

Filed Feb. 11, 1972, Ser. No. 225,462
Int. Cl. E01h *6/00*
U.S. Cl. 15—4 **2 Claims**

The pavement cleaner of the present invention comprises a housing, a brush assembly, and a snow thrower. The housing includes a pair of sidewalls, an endwall, and a topwall, which are operable to form substantially a rectangular box. The housing includes a pair of wheels, each disposed on suitable journaled axle means distally from the terminal end opposite the endwall at the lower terminal edge of each of the respective sidewalls. The housing is provided with a trailing wheel disposed centrally from the endwall on a suitable bracket, the wheel being journaled for rotation and operable to provide dirigible means for the pavement cleaner. A handle, having a pair of bracing bars, is fastened on the sidewalls distally from the endwall. The brush assembly includes a multiplicity of outwardly projecting bristles fastened on a suitable axle. The axle is carried in bearings mounted in vertically disposed slots in each of the sidewalls. The axle is set in rotating motion by means of a suitable drive train. The brush assembly includes a pan having a substantially rectangular bottom wall, a pair of sidewalls fastened upstandingly to the terminal side of the bottom wall, and an endwall fastened upstandingly to the bottom wall and the sidewalls. The pan is operable to be detachably fastened within the housing at its end opposite the endwall.



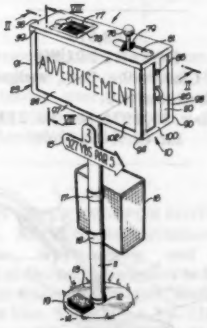
The brush assembly includes a deflector operable to guide material from the bristles into the pan. The pavement cleaner may include a snow thrower including a pan. The pan is provided with a portion convexly curved with respect to the housing and a pair of side deflector walls fastened at each end of the curved portion. The pan is operable to closely conform to the transverse configuration of the end opposite the housing endwall. The snow thrower includes a blade fastened on a suitable axle. The axle is carried on journal bearings which are fastened to the deflector walls. The blade and axle are set in rotating motion by means of a suitable drive train.

3,748,676

GOLF CLUB AND BALL WASH RACK

Allyn G. Warren, 32105 Beachlake Ln., Westlake Village, Calif., and Douglas S. Warren, 27151 Mission Hills Dr., San Juan Capistrano, Calif.

Filed Oct. 12, 1971, Ser. No. 188,356
Int. Cl. A63b *47/04*
U.S. Cl. 15—21 A **8 Claims**



The golf club and ball wash rack includes a housing shell having a base and removable cover within which is provided a first wash tank and associated brush means for washing a golf club head manipulated through a club receiving aperture in the cover and a second wash tank means with associated brush means for receiving and washing a golf ball manipulated via a

ball washer operated through a second aperture in the cover. The housing is mounted by a stand upon a pedestal located adjacent the tee area of a golf course playing area and is provided with a framework of corner and rail members for receiving and mounting an indicia bearing panel therein with upper portions of the panel being fastened to the housing by a depending flange portion of the cover plate. The individual wash tanks are of one piece molded plastic with a first pair of opposed channels with side wall recesses for receiving matingly formed handle portions of brushes and second opposed channels for receiving and guiding portions of the ball washer. The ball washer includes a paddle-like body having a ball receiving port in a head portion of the body connected by a rod to a golf ball-like handle.

3,748,677

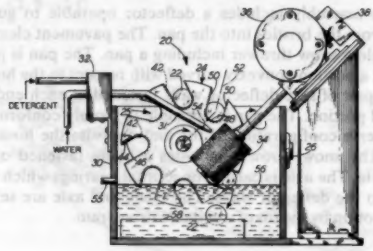
METHODS AND APPARATUS FOR SCRUBBING THIN, FRAGILE SLICES OF MATERIAL

Gerard A. Frank, Allentown; Karl F. Kipp, Nazareth, and Donald R. Oswald, Schnecksville, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 73,473, Sept. 18, 1970, Pat. No. 3,664,872. This application Jan. 31, 1972, Ser. No. 222,233

Int. Cl. A46b *13/04*

U.S. Cl. 15—21 D **10 Claims**



Simultaneously, both sides of a thin, fragile slice of brittle material, such as single-crystal silicon, are scrubbed. The slices are loaded, one at a time, into a rotatable disc having pockets formed in the periphery thereof. The disc conveys the slices between two opposed counter-rotatable brushes within a detergent spray. After passing the rotatable brushes, the slices drop from the disc and float through the detergent bath to a container positioned below the disc.

3,748,678

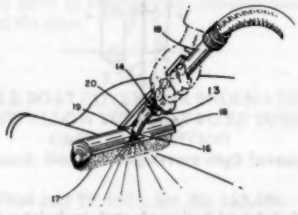
ROTARY BRUSH

Milton L. Ballou, Gloversville, N.Y., assignor to Knight Oil Corporation, Johnstown, N.Y.

Filed Dec. 30, 1971, Ser. No. 213,921

Int. Cl. A46b *13/06*

U.S. Cl. 15—24 **3 Claims**



A high velocity liquid powered rotary brush and attachment used in conjunction with high pressure jet "wands" for the cleaning of autos, machinery, and the like. The brush can enter or be removed from the water spray by means of a lever. The liquid under high pressure enters through the open end of the "jet wand", is forced through a jet nozzle which causes a fan-like spray of water directed at the brush, the impact of the spray causing the brush to rotate. When the washing cycle is completed, the brush can be raised out of the flow of spray by depressing the end of a handle and can be returned by allowing the handle to return to the normal position, thus replacing the brush in the field of spray and starting the rotation again for further washing.

3,748,679

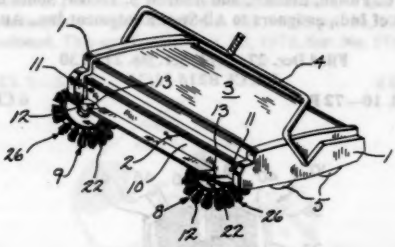
FLOOR SWEEPER WITH AUXILIARY SURFACE LITTER BRUSH MEANS

Henry J. Rosendall, Grand Rapids, Mich., assignor to Bissel Inc., Grand Rapids, Mich.

Filed June 22, 1972, Ser. No. 265,282

Int. Cl. A47l *11/32*

U.S. Cl. 15—42 **14 Claims**



One or more auxiliary brushes are floatingly mounted for sweeping litter from either a carpeted or smooth floor into the path of the main transverse sweeper brush means. The drive for the auxiliary brushes is internal and does not depend upon rotation of the sweeper's main drive mechanism. A caster device drives the auxiliary brushes through a non-circular connection having substantial play therein so that the brushes will readily position themselves to conform to the contour of the surface being swept. Means are provided to limit deformation of the brush bristles against the floor.

3,748,680

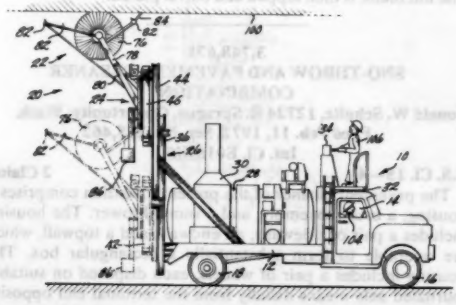
TUNNEL CLEANING APPARATUS

Kenneth Earl Griffin, Seattle, Wash., assignor to Lawrence E. Kramis, Mercer Island, Wash., a part interest

Filed June 14, 1972, Ser. No. 262,770

Int. Cl. A47l *1/38*

U.S. Cl. 15—50 C **14 Claims**



A mobile cleaning apparatus adapted to clean the surface walls of a tunnel. The apparatus comprises a mobile vehicle, such as a flatbed truck, having at the forward end an operator's station, a cleaning assembly at the rear of the truck, and

auxiliary equipment located on the flatbed of the truck. The cleaning apparatus comprises a brush assembly mounted to a movable frame assembly, which is in turn mounted to a vertically oriented base frame upstanding from the rear end of the truck. The movable frame assembly comprises a first frame mounted for vertical motion to the base frame, a second frame mounted for lateral movement to the first frame, and a third frame mounted to the second frame for rotation about a longitudinal axis of the apparatus. By selective movement of the vertical, lateral and angular movement of, respectively, the first, second and third movable frames, the brush assembly can be moved to any transverse and angular position for proper engagement of the surface to be cleaned.

3,748,681

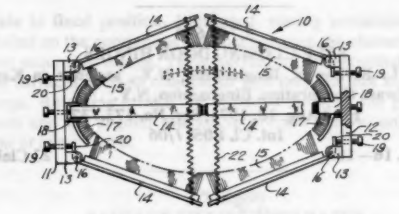
BASKETBALL AND FOOTBALL WASHING HEAD

Milan Samuel Morris, P.O. Box 214, Towner, Colo.

Filed Oct. 22, 1971, Ser. No. 191,587

Int. Cl. A46b *13/02*

U.S. Cl. 15—183 **4 Claims**



A brush contained head for ball washing machines. This device consists primarily of a pair of spaced apart end plates which include brackets for portably carrying the brush arms and a pair of concave brushes, one secured to each of the plates, the plates include adjustment screws for adjusting the spacing apart of the scrubbing brushes to accommodate a football or basketball.

3,748,682

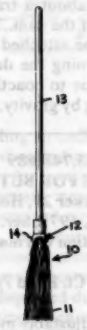
OIL MOP

Herbert M. Rhodes, New Orleans, La., assignor to Oil Mop, Inc., New Orleans, La.

Filed July 27, 1971, Ser. No. 166,458

Int. Cl. A47l *13/20*; E02b *15/04*

U.S. Cl. 15—229 R **1 Claim**



The present disclosure is directed to an oil mop for use by an individual person for removing oil from the top of an oil-water mixture and is directed to the use of narrow thin gauge strips of a petrophilic, aerophobic, hydrophobic material such as fibrillated polypropylene which when dipped into oil and water sops up the oil and leaves the water. A mop so constructed is attached to a handle and may be passed over the oil covered surface similar to mopping a floor and the oil wrung out into any container.

3,748,683

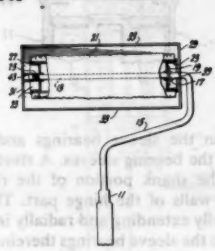
ADJUSTABLE DRIP SHIELD FOR PAINT ROLLER

James E. Smith, 2045 Leese Ln., and Richard J. Oswald, 465 Via Herbosa, both of, Novato, Calif.

Filed May 3, 1971, Ser. No. 139,561

Int. Cl. B44d *3/28*, *3/40*

U.S. Cl. 15—248 A **4 Claims**



A drip shield is removably attached to a conventional paint roller by frictional engagement on the shaft of the roller itself whereby the position of the shield with respect to the handle of the roller may be varied at will.

3,748,684

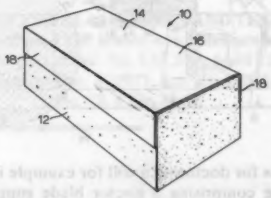
BLACKBOARD ERASER

Ronald E. Fraser, 584 Lawrence Ave. W., Toronto, Ontario, Calif.

Filed Dec. 9, 1971, Ser. No. 206,283

Int. Cl. B43l *21/02*

U.S. Cl. 15—244 R **5 Claims**



An eraser for removing chalk marks from blackboards, consisting of a block of non-reticulated, flexible, polyester urethane foam having inter-connected air cells and from about 70 to about 100 pores per linear inch, the block being supported by a channel-shaped holder.

3,748,685

WINDSCREEN WIPER ARM FOR MOTOR VEHICLES

Reinhard Edele, Bietigheim-Metterzimmern; Kurt Bauer, Kleiningersheim, Wurttemberg, and Christian Roth, Bietigheim, all of Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Bietigheim, Germany

Filed Mar. 3, 1972, Ser. No. 231,682

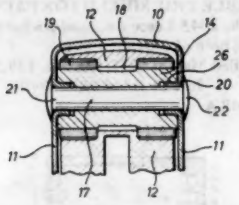
Claims priority, application Germany, Mar. 17, 1971, P 21 12 801.8

Int. Cl. B60s *1/32*

U.S. Cl. 15—250.35 **6 Claims**

A windshield wiper arm assembly for motor vehicles comprises a headpiece which has a recess which is adapted to engage over the wiper bearing which is rotatable or oscillatable. The assembly includes a hinge part which is pivotally mounted on the headpiece for movement toward and away from the

wiper plane. The hinge part is of U-shaped construction and includes outer side walls which are formed with inwardly extending bearing sleeve portions which form annular sleeve bearings and which extend axially in a direction between the side walls. A rivet having a shank portion with a head at each

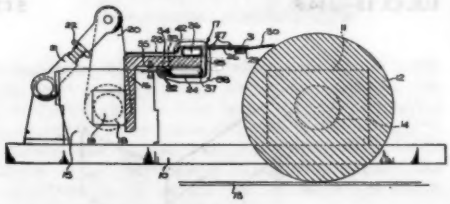


end is engaged in the sleeve bearings and the heads are deformed against the bearing sleeves. A rivet bearing bush is secured around the shank portion of the rivet and locked between the side walls of the hinge part. The rivet bearing bush includes axially extending and radially indented recesses which accomodate the sleeve bearings therein.

3,748,686
ROLL DOCTOR APPARATUS

Charles Barry Winterburn, Bury, and Thomas Scholes, Ramsbottom, both of England, assignors to Joseph Winterburn Limited, Lancaster, England

Filed June 3, 1971, Ser. No. 149,573
Claims priority, application Great Britain, June 6, 1970, 27,442/70
Int. Cl. D21g *3/02, 3/04*
U.S. Cl. 15—256.51 **4 Claims**



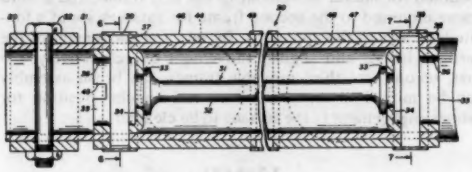
Apparatus for doctoring a roll for example in a paper-making machine comprising a doctor blade support of channel form in a number of side-by-side sections for example of sheet metal, the support being pivotally mounted on a carrier projecting into the channel, and two inflatable tubes interposed between the carrier and the support for pivoting the support to cause the doctor blade to engage with or disengage from the roll. The walls of the channel are substantially continuous and cover completely the tubes and the external surfaces of the channel are provided by smooth, plane and/or curved surfaces which are devoid of ribs.

3,748,687
TORSION CLOSER DEVICE

Felix B. Romberg, P. O. Box 218, Holland, Tex.

Division of Ser. No. 106,807, Jan. 15, 1971. This application Feb. 25, 1972, Ser. No. 229,599
Int. Cl. E05f *1/08*
U.S. Cl. 16—75 **1 Claim**

The specification discloses a rectangular gate normally latched at one end and including an initially stressed torsion bar spring horizontally disposed at the other end. When thrust from a vehicle is applied to the gate, the gate yields along the bottom while rotating along an upper horizontal axis, thereby storing energy in the bar spring and releasing the latch. Propelled by the spring stored energy, the released gate then springs about a vertical axis to an open position. The gate includes an improved vertical gate supporting post mechanism, an improved initially stressed torsion bar spring, a vehicle

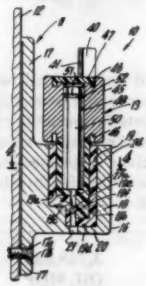


bumper contact device to eliminate scuffing of the vehicle bumper and an improved hooking mechanism to protect a unitary frame connection between the gate ends from additional wire tension.

3,748,688
SELF-CLOSING DOOR HINGES

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,737
Int. Cl. E05f *1/06*
U.S. Cl. 16—153 **23 Claims**



The hinge comprises a flange attachable to a door jamb and a strap attachable to a door. A cam is fixed to the flange and a follower for said cam has a polygonal rod fixed thereto and protruding therefrom.The rod is insertable into a complementary through hole in the strap from either end of the hole so that the strap can be reversed 180° with respect to the flange. The cam is symmetrical about a transverse diametric plane passing through the axis of the cam. The follower matches the cam. The strap can thus be attached to either a right hand or left hand door. Upon turning the door from closed to open position, the door rises due to coaction of cam and follower, and the door is self closing by gravity.

3,748,689
ADJUSTABLE HINGE FOR BUTT-CLOSING DOORS

Hellmuth Grunert, Hausacker 29, Hoffnungsthal, Germany

Filed Sept. 30, 1971, Ser. No. 185,032
Claims priority, application Germany, Oct. 6, 1970, P 20 48 935.4
Int. Cl. E05d *7/04*
U.S. Cl. 16—129 **11 Claims**

A hinge assembly for adjustably mounting at least one door leaf to a face of a frame wall member. A first mounting means is mounted on the frame wall member and a second mounting means is mounted on the door leaf. The first mounting means includes a plate element, a hinge angular support bracket and a hinge pin bracket connected in series so as to provide adjustable movement between the frame wall member and the

door leaf member in two distinct intersecting planes which are held in fixed angular relationship with each other. In one embodiment the adjustment planes are perpendicular to each other and one of the planes is held parallel to the surface of the frame wall member. Projections on the rear side of the mounting plate element are impressed into the surface of the frame wall member in order to rigidly position and hold the

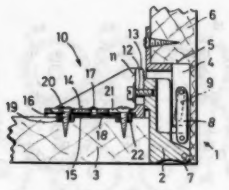


plate in fixed position. Elongated, mating serrations are included on the contiguous surfaces between the elements of the first mounting means. These serrations are provided to hold the surfaces in fixed relation so that they will not slip during usage. Retaining means are provided between the plate element and the angular bracket to prevent inadvertent separation or loss of parts.

3,748,690

SAUSAGE FILLING APPARATUS

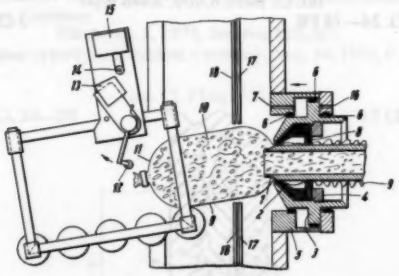
Herbert Niedecker, 6243 Falkenstein (Taunus), Am Ellerhang 6, Germany

Filed Apr. 8, 1971, Ser. No. 132,464

Claims priority, application Germany, Apr. 17, 1970, P 20 18 454.7

Int. Cl. A22c *11/02*

U.S. Cl. 17—33 **12 Claims**



In an apparatus for filling an endless tubular distensible casing closed at one end and extending over a filling pipe, the apparatus including means for constricting said filled casing at predetermined time intervals, means for forming two spaced closures at the constriction, and means for severing said casing between said closures, the improvement which comprises means for releasing additional casing toward said constricting means when the latter are actuated, whereby spaced is provided to take up filling displaced during said constriction. The release of additional casing is achieved by a snubbing element which bears against the filling pipe with the casing therebetween and which is displaced forwardly during constriction. The forward displacement either pushes additional casing forward or releases the casing slightly so it can be pulled forward by the force of displaced filling during constriction.

3,748,691

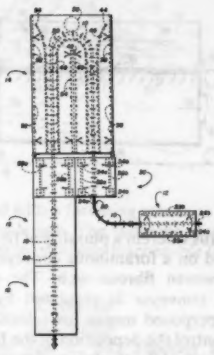
VAPORIZING APPARATUS FOR TREATMENT OF ANIMAL CARCASSES

Bryan T. Snowden, Grapevine, Tex., assignor to FEI, Inc., Dallas, Tex.

Division of Ser. No. 831,964, June 10, 1969, Pat. No. 3,631,563. This application July 28, 1971, Ser. No. 167,048

Int. Cl. A22c *21/04*

U.S. Cl. 17—11.2 **4 Claims**



A compartmented housing is inclined at a predetermined angle relative to the horizontal, with a path being defined through the housing for travel of animal carcasses, such as poultry, therethrough. Spray nozzles project from a generally smooth inner surface of the housing for directing high temperature steam upon preselected portions of the animal carcasses. The entry of ambient air into the housing is regulated to maintain a desired temperature within the housing. A prewetting station initially wets the animal carcasses prior to entry into the compartmented housing.

3,748,692

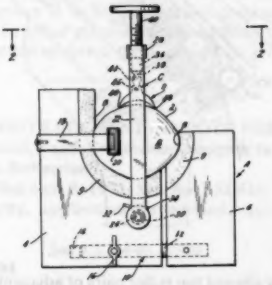
OPENER FOR CLAM SHELLS AND THE LIKE

Joseph V. Valentino, 1120 Jensen Ave., Mamaroneck, N.Y.

Continuation-in-part of Ser. No. 133,212, April 12, 1971. This application Dec. 1, 1971, Ser. No. 203,719

Int. Cl. A22c *29/00*

U.S. Cl. 17—76 **24 Claims**



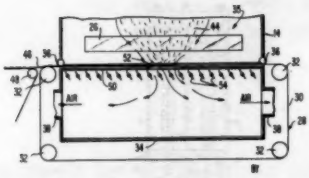
An opener for shell fish such as clams, oysters, mussels, scallops and the like, in which the shell is held on a support with the seam between its shell parts exposed, and a knife is mounted on that support for movement toward and away from the shell, thereby to penetrate the seam, and for further movement to sever the seam along its length, thus permitting the shell to be opened and exposing the meat inside the shell. In one embodiment that further movement generally corresponds to the path of the seam, and in a second embodiment it generally corresponds to a prolongation of the penetrating movement.

3,748,693

APPARATUS FOR MAKING NONWOVEN FIBROUS WEBS

Paul W. Jespersen, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Mar. 26, 1971, Ser. No. 128,460
Int. Cl. D01g 25/00
U.S. Cl. 19—156.3 3 Claims



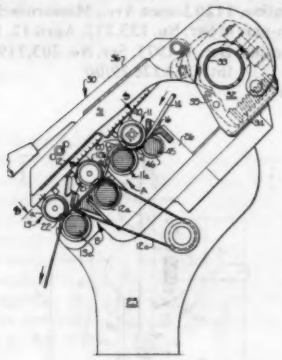
An apparatus wherein a plurality of fibers are transported to and deposited on a foraminous conveyor by a flow of gas to form a nonwoven fibrous web. The passage of the flow through the conveyor is regulated by two independently operable, superposed means for selectively restricting such passage to control the deposition of the fibers on the conveyor and thereby control the thickness of the web.

3,748,694

DRAFTING SYSTEM HAVING A SUPPORTING ROLL FOR OFFSET TOP FEED ROLL

Stefan Staneff, Herzongenaurach, Germany, assignor to Industriewerk Schaeffler, OHG, Herzongenaurach, Germany

Continuation-in-part of Ser. No. 153,615, June 16, 1971. This application Nov. 3, 1971, Ser. No. 195,160
Int. Cl. D01h 5/70
U.S. Cl. 19—258 5 Claims



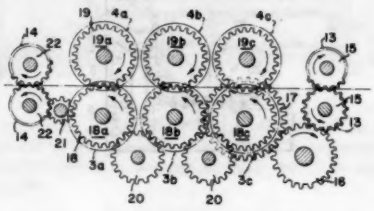
The axially aligned top roller pairs of adjacent drafting units of a spinning, twisting or roving machine are journaled on respective shafts, and that top roller pair which serves as the top feed roll of two adjacent drafting units is positioned in nipping relation to a corresponding bottom feed roll, but the top feed roller pair is offset rearwardly of the bottom feed roll. Therefore, in order to prevent the top feed roller pair from tilting excessively about the point at which the load is being applied to the shaft therefor, an idler supporting roll is positioned beneath and in nipping relation to the top feed roller pair and is rotatable by the top feed roller pair and the strands passing between the same and the idler roll.

3,748,695

ROTARY DRAFTING APPARATUS

Masakazu Shino, No. 13, 3-chome, Sanwa-cho, Yamatotakada, and Shizuka Sako, No. 782, 3-chome, Kashiwai-cho, Kasugai, both of Japan

Filed May 13, 1971, Ser. No. 143,044
Claims priority, application Japan, May 14, 1970, 45/41106
Int. Cl. D01h 5/24
U.S. Cl. 19—293 2 Claims



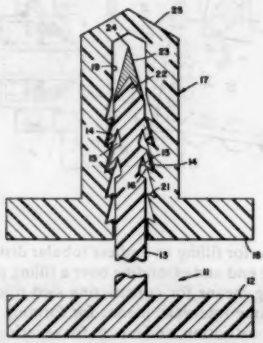
Proposed in this invention is a rotary drafting apparatus particularly featured by a improved mechanism in which the relative positional relation between the needles formed integrally on the control plate arranged in vertically opposed relation is normally maintained in a prescribed state only through the meshing of gears provided coaxially with the control plates each of which has integrally formed along the circumference thereof a plurality of radially extending needles.

3,748,696

FASTENER

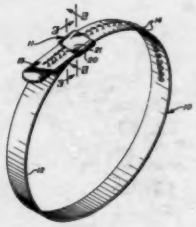
Macklin F. Martin, 6015 Herzog St., Oakland, Calif.

Filed Jan. 19, 1972, Ser. No. 218,942
Int. Cl. B65d 63/00; A44b 9/00
U.S. Cl. 24—16 PB 3 Claims



A plastic fastener for joining objects together wherein a bolt member has a sharpened shank which pierces the object to be joined and normally outwardly projecting but inwardly flexible anchor members formed integrally on the shank to engage shoulders on a nut member. After the bolt pierces the object, the nut is forced axially onto the bolt shank, flexing the anchor members inwardly, the anchor members then springing out into engagement with internal shoulders in the bore of the nut to hold the nut onto the bolt.

3,748,697
CLAMP ASSEMBLY FOR HOSE, PIPE AND LIKE ARTICLES
Louie J. Marchese, 5116 N. 17th St., Phoenix, Ariz., and Robert A. Hildebrandt, P.O. Box 42, Queen Creek, Ariz.
Filed Dec. 20, 1971, Ser. No. 209,593
Int. Cl. B65d 63/02
U.S. Cl. 24—19 3 Claims

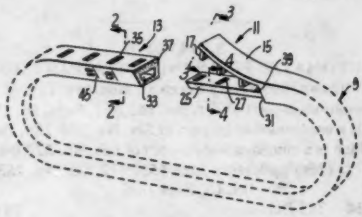


A clamp assembly employing a novel fastener mounted on a band for coacting in an improved manner with perforations extending laterally across the band for facilitating tightening of the band around an object without tearing the peripheries of the perforations.

3,748,698
CONNECTING ELEMENT FOR CONNECTING TWO ENDS OF A CONVEYOR BELT
Hans-Peter Lachmann, Cologne, Germany, assignor to Precismeca Gesellschaft fur Fordertechnik mbH, Sulzbach/Saar, Germany
Filed Aug. 2, 1971, Ser. No. 168,281
Claims priority, application Germany, Aug. 10, 1970, P 20 39 608.1
Int. Cl. F16g 3/00
U.S. Cl. 24—38 15 Claims

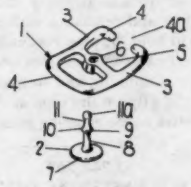
A connector arrangement for mounting on belt ends to form an endless belt. The belt has tension elements in the form of wires or cables therein. The connector arrangement has bendable legs to receive the belt ends with spikes thereon adapted to be driven into, or through, the respective belt end.

3,748,699
VARIABLE LENGTH V BELT
Byron H. Cunningham, 1013 Cedar St., Santa Cruz, Calif.
Filed May 19, 1972, Ser. No. 254,884
Int. Cl. F16g 7/00
U.S. Cl. 24—38 6 Claims



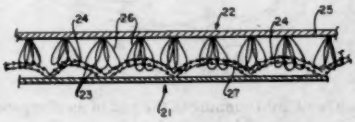
A V belt is provided with a fastening means so that the belt can be cut to a desired length. The fastening means also enables one to install a belt in relatively inaccessible locations.

3,748,700
BUCKLES
Sally Margaret Willey, Flat C, 622 Finchley Rd., Golders Green, London, N.W. 11, England
Filed May 19, 1971, Ser. No. 144,852
Claims priority, application Great Britain, May 20, 1970, 24,483/70
Int. Cl. A44b 11/20, 11/25
U.S. Cl. 24—172 11 Claims



A buckle, e.g., for fastening shoes or the like, the buckle comprising a buckle member and a securing member, one of the members comprising a projection which can be passed through an aperture in an article to which the buckle is to be attached and the other member being adapted to cooperate with said projection to secure the buckle to the article.

3,748,701
ADHESIVE ELEMENT IN CLOTH FORM
George De Mestral, Vaud, Switzerland, assignor to Velcro S.A., Soulie, Nyon, Switzerland
Filed Apr. 8, 1971, Ser. No. 132,513
Claims priority, application Switzerland, Apr. 29, 1970, 6422/70
Int. Cl. A44b 17/00
U.S. Cl. 24—204 12 Claims



A fastening member is disclosed for use in a separable fastening device of the type including two fastening members each having an engaging surface defined by a plurality of

hooking elements. At least one of the members comprises a base sheet having a plurality of resilient threads in the form of arches secured to the base sheet and extending from one surface thereof. The threads are of unitary construction and include a core portion and at least one lobe extending from the core. Each of the lobes include a plurality of serrated notches which define a multiplicity of hook-type hooking elements along each of the lobes.

3,748,702

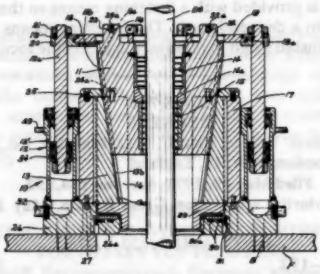
AUTOMATED PIPE HANDLING APPARATUS

Cicero C. Brown, 8490 Katy Freeway, Houston, Tex.

Continuation-in-part of Ser. No. 181,067, Sept. 16, 1971, which is a continuation-in-part of Ser. No. 206,259, Dec. 9, 1971, which is a continuation-in-part of Ser. No. 229,041, Feb. 24, 1972. This application June 15, 1972, Ser. No. 263,244

Int. Cl. F16l *7/00*

U.S. Cl. 24—263 DG **25 Claims**



An apparatus in which gripping members are moved hydraulically to grip and release a well pipe. The apparatus may be employed to hold the pipe vertically, to impart a rotary motion to the pipe or to serve as a back-up preventing rotary motion of the pipe. Camming and wedging surfaces are provided to increase the grip on the pipe as the forces tending to move the pipe relative to the gripping members increase.

3,748,703

CLIP HOOK FOR FASTENING DEVICES SUCH AS SPIDERS FOR SECURING OBJECTS ONTO LUGGAGE CARRIERS

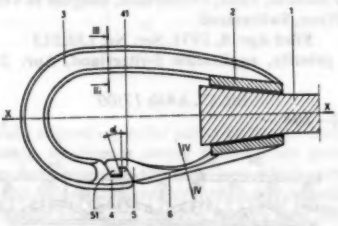
Camille Jean Maillocheau, Tours, France, assignor to Royoda Societe A. Responsabilite Limitee Dite, Montreuil (Seine Saint Denis), France

Filed July 23, 1971, Ser. No. 165,059

Claims priority, application France, July 30, 1970, 7028228; Dec. 15, 1970, 7045204

Int. Cl. A44c *5/18*

U.S. Cl. 24—265 SH **7 Claims**



A snap hook for fastening to the end of an elongated tension member such as an elastic cord to form a spider of cords for securing an object onto a roof-rack of an automobile, said hook formed of integrally moulded plastic material produced, for instance, by injection moulding.

To give the snap hook sufficient strength, its end and the corresponding end of the clip are each provided with a coupling element which engage in one another thereby making a closed loop.

3,748,704

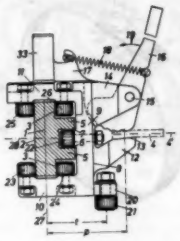
CLAMP FOR BIAXIAL STRETCHING MACHINES

Willi Schmidt, Elsenroth; Rainer Berzbach, Homburg-Brol, and Klaus Berger, Runderoth, all of Germany, assignors to Erwin Kampf Maschinenfabrik, Wichl, Germany

Filed Jan. 4, 1972, Ser. No. 215,297

Int. Cl. D06c *3/10*

U.S. Cl. 26—62 B **3 Claims**



A clamp having means for clamping a film to be biaxially stretched has means, generally vertically aligned with the clamping means, for engagement by a driving member to thereby minimize twisting torques about a vertical axis. The clamp further has opposed and longitudinally spaced rollers engaging a guide rail to resist any tendency for the clamp to twist on the guide rail.

3,748,705

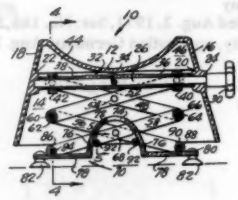
EMBALMER'S HEADREST

Felix W. Deaton, deceased, late of Dallas, Tex., and by Mrs. Felix W. Deaton, spouse, Dallas, Tex., assignors to Al Cortez, Sr., Dallas, Tex.

Filed June 4, 1971, Ser. No. 149,920

Int. Cl. A01n *1/00*

U.S. Cl. 27—21 **5 Claims**



A head rest is made up of an outer casting having a head-receiving trough and opposed bosses formed at each end of the trough. A rod having a turning knob at one end has bearing in both said bosses. A sleeve surrounds the rod and is keyed thereto. The sleeve has threads of opposite pitch at each of its ends. A nut is threaded on each end of said sleeve. Each nut is pivoted at each of its ends to a link of a lazy-tongs linkage. A second, inner casting provides support for the foregoing structure and has horizontal guides for the free ends of the links at the opposite end of said lazy-tongs unit.

3,748,706

HAND WEAVING DEVICE

John S. Doyel, 404 W. 20th St., New York, N.Y.

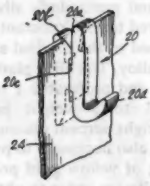
Filed Jan. 31, 1972, Ser. No. 221,939

Int. Cl. D03d *29/00*

U.S. Cl. 28—15 **9 Claims**

A hand weaving device comprising a frame having a peripheral strip provided with a row of notches each receiving a H-shaped hook formed of two parallel bars connected by a

stem, with the stem received in the notch and with the bar ends below the stem straddling the strip. Warp yarn is stretched between yarn holding means formed on the H-shaped hooks and warp yarn holding means opposite each hook across the frame. Weft yarn is woven without the need for shuttles or needles of any kind by alternately passing weft



yarn under a hook to get the yarn between a warp yarn and the frame, and over a hook. The frame may be rectangular, with a row of hooks at one edge of the rectangular frame and a row of warp yarn holding pins at the opposite edge of the rectangle, or it may be round, with a row of hooks arranged around the periphery thereof and with warp yarn sretched from hook to diametrically opposite hook.

3,748,707

ELECTRONIC YARN CLEANER

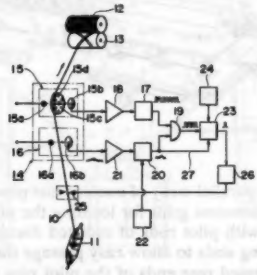
Wataru Aihara, and Takashi Kawamoto, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto City, Japan

Filed Oct. 15, 1971, Ser. No. 189,542

Claims priority, application Japan, Oct. 20, 1970, 45/92687

Int. Cl. D02j *1/14*

U.S. Cl. 28—64 **7 Claims**



A yarn cleaner capable of generating a signal for instigating the cutting of a travelling yarn in response to the thickness thereof measured in relation to the length thereof, only when the value of this signal exceeds a predetermined value. For determining as to whether the value of the instigating signal exceeds the predetermined value, a plurality of counters is provided from which the instigating signal can be generated in response to the achievement of a specific condition.

3,748,708

PROCESS FOR CONTROLLING CATHODE RAY TUBE CUTOFF VOLTAGE BY CATHODE INSERTION WITH ACCELERATING GRID COMPENSATION

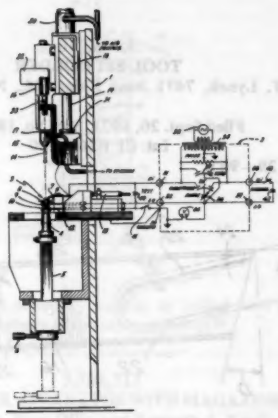
Robert W. Schweitzer, Kokomo, Ind., and Harvey J. Drury, Sellersville, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 15, 1971, Ser. No. 198,834

Int. Cl. H01j *9/18*

U.S. Cl. 29—25.15 **13 Claims**

A process for positioning the electrodes of an electron gun in a cathode-ray tube with respect to one another to cause the electron gun to have a cutoff voltage closely conforming to a predetermined value. The cathode to control grid interelectrode capacitance of the gun is measured on a capacitance bridge during the cathode insertion operation. An initial bridge balance is obtained with the cathode just barely inserted into its support structure. A reference capacitor equal to the change in capacitance required to bring the cathode to its desired position is added to the standard arm of the bridge,



and the bridge rebalanced during insertion by moving the cathode toward the control grid. The effect of variations in control grid to accelerating grid spacing is compensated by connecting the control grid to accelerating grid interelectrode capacitance in tandem with a series capacitor across the control grid to cathode interelectrode capacitance when rebalancing the bridge.

3,748,709

APPARATUS FOR MAKING THE STOPS OF A SLIDE FASTENER

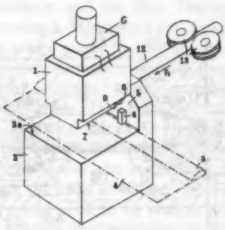
Marcel Potin, Choisy-le-Roi, France, assignor to Societe Financiere Francaise De Licences Et Brevets, Choisy-le-Roi, France

Filed Aug. 4, 1970, Ser. No. 60,891

Claims priority, application France, Aug. 7, 1969, 6927109; June 1, 1970, 7019985

Int. Cl. A44b *19/36*

U.S. Cl. 29—34 A **7 Claims**



The invention provides a process for making the stops at the ends of the rows of interlocking units in a slide fastener by moulding these stops from thermoplastic material directly on to the ends of the rows of the interlocking units, the operation being performed by positioning the corresponding row of interlocking units between two complementary parts forming a stamp and a block and by also placing between these two parts a fragment of thermoplastic material obtained by cutting it from the end of a continuous strip of such material which is moved forward in jerks, the fragment being moulded by sub-

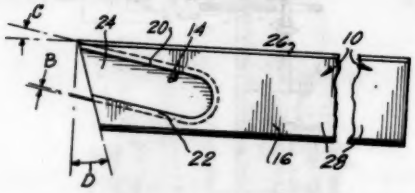
jecting it to the effect of heat, for example by transmitting ultrasonic vibrations to it while it is held between the two parts which form the stamp and the block and, after joining, leave between them a die cavity in the shape of the stop which is to be made.

3,748,710

TOOL BIT HOLDER

Frank T. Lynch, 7471 Bear Ridge Rd., North Tonawanda, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,811
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 R 8 Claims



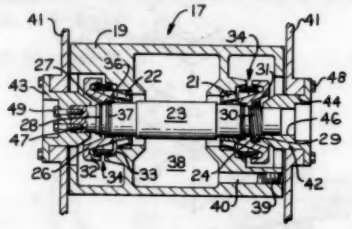
This invention provides a holder for throw-away carbide tool bits useful for machining operations including cut-off, turning, facing, boring and the like. The holder comprises: an elongated shank; and a generally axially extending reentrant slot recessed in a surface of the shank, the slot having side edges tapered outwardly from the outer to the inner part of the slot, whereby a tool bit having corresponding tapered edges can be removably inserted into the slot.

3,748,711

LUBRICATED FAIRLEAD ROLLER ASSEMBLY

Duane R. Smith, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 19, 1971, Ser. No. 144,884
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 R 5 Claims



A lubricated roller assembly comprising a shaft having a hub rotatably mounted thereupon by means of bearings spaced inwardly from the axial ends of the hub. Lubrication means for the roller assembly include an oil chamber formed within the hub and suitable seals disposed axially outwardly of the bearings for retaining the oil. The roller assembly is disposed between support plates on a fairlead arch and is mounted thereupon by trunnion caps which are secured within bores in the support plates.

3,748,712

TARNISH RESISTANT PLATING FOR SILVER ARTICLES

Kenneth J. Karawin, Chester Twsp., Pa., assignor to Franklin Mint Corporation, Franklin Center, Pa.

Filed Mar. 30, 1971, Ser. No. 129,595
Int. Cl. B32b *15/00*
U.S. Cl. 29—119 7 Claims

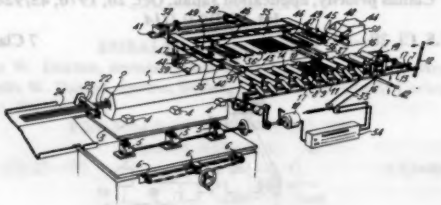
Articles made of silver or silver alloys containing a high percentage of silver, and particularly silver medals and medallions may be rendered tarnish resistant while still possessing a color closely matched to the original article by plating with a rhodium-platinum alloy. The alloy plating has a thickness of 1 to 50 microinches, and preferably 1 to 10 microinches, and comprises about 1 to 9 weight percent platinum, and preferably 3 to 5 weight percent platinum, with the remainder being rhodium. It is also necessary to provide the silver article with a flash plating of yellow gold prior to plating with the rhodium-platinum alloy in order to obtain the optimum color match.

3,748,713

APPARATUS FOR INSERTING RODS INTO A FRAME

John Basil Tindale, Reading, and James Henry Burgess, Silchester, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Division of Ser. No. 753,574, Aug. 19, 1968, Pat. No. 3,604,100. This application Jan. 13, 1971, Ser. No. 106,033
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—200 P 3 Claims



To insert a parallel array of nuclear fuel pins into a wrapper containing transverse grids for locating the pins, the wrapper is first filled with pilot rods of reduced diameter and having tapered leading ends to allow easy passage through the grids. Next the recessed rear ends of the pilot pins are engaged by the front ends of the fuel pins and the latter thrust into the wrapper so that they displace the pilot rods.

Successive rows of fuel pins are thrust into the wrapper by apparatus comprising a plurality of resiliently-mounted, grooved roller pairs which locate a row of fuel pins between them, the rear ends of the pins being engaged by a thrust-head which passes between the rollers of each pair.

3,748,714

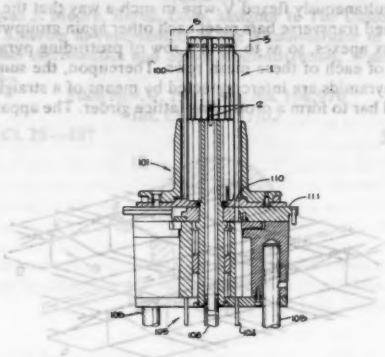
COIL INSERTION DEVICE

Vernon E. Kieffer, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 24, 1971, Ser. No. 117,918
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 R 11 Claims

A coil assembling apparatus where prewound coils and strips of insulation are inserted axially into the slots of a stator core has an integral blade and stripper-impeller combination. Individual blades of the combination are interconnected by a curvilinear plate in a predetermined order, forming a series of magnet wire receivers between adjacent plates. The blades are arranged annularly and each plate connects two blades. The blades and plates form a solid base section which is fitted to a

conventional actuator for mechanically driving the integral combination through the stator bore axially. The exterior surface of each blade is grooved and an individual stator tooth is positioned within the groove of each blade during the insertion process.

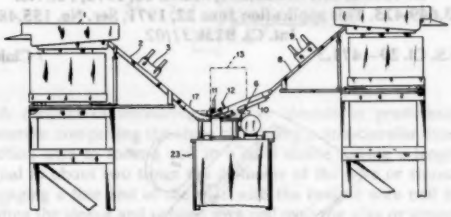


3,748,715

AUTOMATIC ASSEMBLY MACHINE FOR FILM CARTRIDGES

James Eugene Hoover, Binghamton; Robert Wilson Houser, Vestal, and Bernard Clifford Sheffer, Binghamton, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 9, 1971, Ser. No. 196,969
Int. Cl. B23q *7/10*; B23p *19/04*
U.S. Cl. 29—211 D **8 Claims**



A film cartridge assembly and loading apparatus in which a scroll of film and paper backing are automatically taped to a spool and fitted into a suitable cartridge body and cover unit. The apparatus includes two principal assembly units; the first for pre-assemblying the cartridge body and cover and the second for inserting a scrolled film and paper spool into the cartridge and ultrasonically sealing the cartridge. A notcher, labeler and torque-testing apparatus are included as part of the present invention.

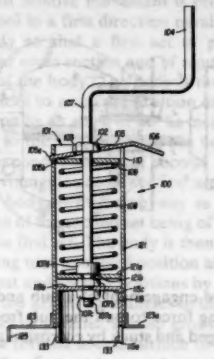
3,748,716

STARTER SPRING ASSEMBLY TOOL AND METHOD

Robert Charles Fidler, Culver City, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed June 17, 1971, Ser. No. 154,019
Int. Cl. B23p *19/04*; G04d *1/04*
U.S. Cl. 29—228 **4 Claims**

A starter spring assembly tool utilizing relatively rotatable bodies for selectively holding the ends of the starter spring to be coiled prior to its insertion within a housing. An inner cylinder is rotatably disposed within an outer cylinder so that rotation thereof will cause the spring to coil or uncoil. Locking or clutching means are provided for preventing relative rotation of the inner and outer cylinders while the spring is being coiled and after it is tightly wound, or coiled, and engaged with the outer periphery of the inner member.

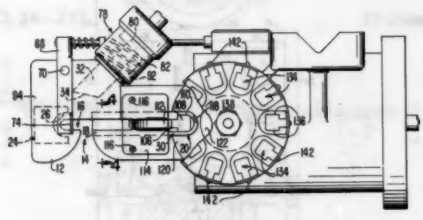


3,748,717

CLIP FASTENER APPARATUS WITH MAGAZINE FEED

Edward K. Leffler, West Ollis, and Kenneth A. Kraft, Milwaukee, both of Wis., assignors to John Mohr & Sons, Milwaukee, Wis.

Filed Feb. 11, 1971, Ser. No. 114,430
Int. Cl. B65b *51/04*; B23q *7/10*
U.S. Cl. 29—211 D **4 Claims**



Apparatus for use in fastening U-shaped clips around the twisted necks of flexible bags of the type suitable for use in containing poultry products and the like. The apparatus includes structure for moving a clip toward and tightly about the twisted neck of a bag and a guide for feeding a clip into the path of travel of a ram which moves the clip toward the bag neck. A magazine having a number of guide members thereon is rotatably mounted above the clip guide, the magazine being adapted to hold a number of stacks of clips on respective guide members thereof so that, when a guide member is aligned with the clip therebelow, the stack can gravitate onto the clip guide to permit the clips to be fed one-by-one out of the stack and toward a bag neck to be sealed. Means is provided for releasably holding the magazine in any one of a number of operative positions.

3,748,718

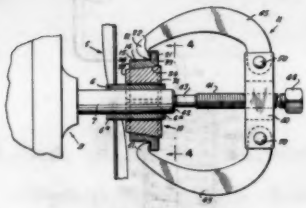
PULLING TOOL

Curtis J. Russell, 9344 Havencove, Dallas, Tex.

Filed Mar. 11, 1971, Ser. No. 123,152
Int. Cl. B23q *3/06*
U.S. Cl. 29—283 **2 Claims**

A pulling tool for removal of a hub from a shaft including a pulling ring having a peripheral flange engageable by a conventional puller and an internal tapered bore adapted to

receive a pair of split semi-annular jaws which have internal teeth for engaging the outer surface of the hub on a shaft. The



tool permits the engagement of a hub and the application of sufficient pulling force to pull the hub from a shaft on which the hub is engaged and stuck by corrosion and the like.

3,748,719

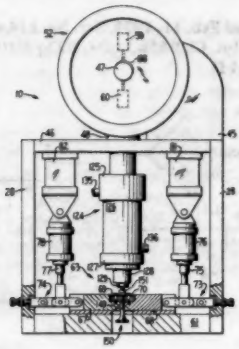
METHOD FOR FLASH REMOVAL

Francis W. Fuller, and Jozef Kiwalle, both of Peoria, Ill., assignors to Production Technology Inc., Peoria, Ill.

Filed Dec. 27, 1971, Ser. No. 212,391

Int. Cl. B23k *31/02*

U.S. Cl. 29—481 **6 Claims**



A method and apparatus for removing hot flash from a welded article including a receiving unit for accepting the welded article from a welding machine, apparatus for quickly transferring the article to a flash removal station, and a flywheel powered flash removing apparatus. The welding machine, receiving unit, transfer apparatus, and flash removing apparatus are controllably interconnected for sequential operation to provide a relatively high speed flash shearing and stripping operation.

3,748,720

PROCESS FOR THE PRODUCTION OF REINFORCEMENT

Gijsbert Versteeg, Nunspeet, Netherlands, assignor to Imex A.G., Zurich, Switzerland

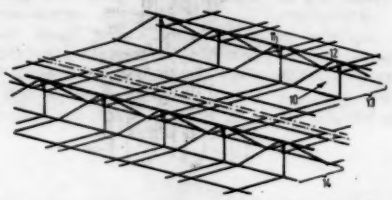
Filed Feb. 14, 1972, Ser. No. 226,175

Claims priority, application Switzerland, Feb. 18, 1971, 2378/71

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.3 **4 Claims**

A reinforcement for concrete ceilings, concrete walls and the like is produced by providing first a reinforcing mat from longitudinal reinforcing bars and groupwise disposed transverse reinforcing bars. In one or more spaced rows of meshes of the mat which extend parallel to the longitudinal reinforcing bars, the transverse bars of each group in such mesh rows are bent apart in directions obliquely to the plane of the mat and simultaneously flexed V-wise in such a way that the bent and flexed transverse bars meet each other again groupwise at their flex apexes, so as to form a row of protruding pyramids instead of each of these mesh rows. Thereupon, the summits of the pyramids are interconnected by means of a straight individual bar to form a protruding lattice girder. The apparatus



for producing such reinforcement comprises pairwise supporting means to receive and support the reinforcing mat, pairwise securing means cooperating with the supporting means for holding the mat, bending means for simulatenously bending apart and V-wise flexing the transverse bars of a row of meshes, transport means for handling a straight individual bar, and welding means for welding the individual bar to the row of pyramids formed by bending and flexing the transverse bars of a row of meshes.

3,748,721

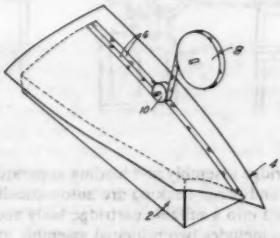
METHOD OF MAKING COMPOSITES

John A. Alexander, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 20,551, March 18, 1970, Pat. No. 3,649,425. This application June 22, 1971, Ser. No. 155,483

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.3 **7 Claims**



Components, such as airfoils for jet engines and other complex shaped parts, are provided by fiber-reinforced, high-strength, lightweight metal matrix composites economically prepared to close dimensional tolerances by applying matrix tapes in side-by-side relation to a contoured metal base sheet or foil and building up a body of the desired thickness and shape with super-imposed layers of such applied tapes, which are then covered with a contoured metal cover sheet or foil. Each layer may be bonded to the underlying layer by resistance diffusion bonding, and the cover sheet is bonded to the base sheet prior to hot pressing the entire assembly to the finished size and shape. The tapes are preferably composed of refractory filaments, such as boron, running lengthwise, and embedded in a metal matrix which is fully consolidated. The metal matrix and base and cover sheets are preferably composed of aluminum or titanium alloys, and the interior of the covered article is preferably evacuated prior to pressure bonding.

3,748,722

PRODUCTION OF HOLLOW COMPONENTS FOR ROLLING ELEMENT BEARINGS BY DIFFUSION WELDING

Thomas J. Moore, Berea, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 9, 1971, Ser. No. 196,970
Int. Cl. B23k 31/02
U.S. Cl. 29—487 3 Claims

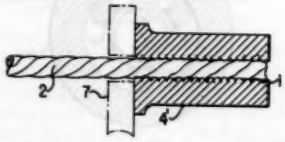
A hollow rolling element for a bearing is fabricated by diffusion welding hollow shells together.

3,748,723

METHOD OF ANCHORING WIRES AND STRANDS IN PRESTRESSED CONCRETE

Hiroyuki Tomioka, Amagasaki, Japan, assignor to Shinko Wire Co., Ltd., Amagasaki-City, Hyogo-Prefecture, Japan

Filed June 4, 1971, Ser. No. 150,029
Claims priority, application Japan, Dec. 3, 1970, 45/107846
Int. Cl. B21d 39/00; B23p 11/00
U.S. Cl. 29—517 11 Claims



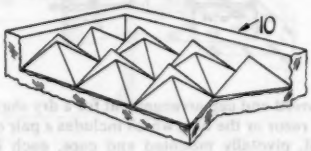
A method of anchoring wires or strands in prestressed concrete comprising the steps of twisting a non-circular cross section wire to form a coil in a steel sleeve having a length equal to about two times the diameter of the wire or strand, engaging a free end of the wire with the twisted wire coil by sliding the sleeve and twisted wire coil over the wire or strand, and fixing the sleeve by swaging or pressing within the range of 10–30 percent of reduction ratio. Thus, an anchorage having improved anchorage efficiency which avoids shearing failure of PC wire at the point of anchorage is provided.

3,748,724

REFLECTOR PANELS FOR ROAD VEHICLES

Maurice Trevor Beasley, 2 Amos Ave., Nuneaton, England

Filed May 10, 1971, Ser. No. 141,822
Claims priority, application Great Britain, May 19, 1970, 24,043/70
Int. Cl. B23p 13/04
U.S. Cl. 29—558 1 Claim



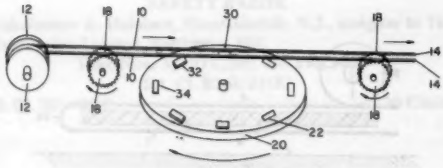
In a method of manufacturing a mould part for use in the manufacture of a reflector panel for a road vehicle, a body is located in a first position relative to a rotatable cutting tool, the body having a substantially flat surface and the cutting tool having a cutting insert of triangular cross section. The cutting tool is rotated whilst relative movement is provided between the body and the tool in a first direction parallel with the flat surface of the body so that a first set of parallel, spaced grooves of triangular cross section and of equal depth are cut in the flat surface of the body. The body is then rotated relative to the cutting tool to a second position angularly spaced from the first position by an angle of 60° as measured about an axis at right angles to the flat surface of the body. Then, with the body in said second position, a second set of parallel, spaced grooves of triangular cross section are formed in the flat surface of the body in the same way as the first set of grooves, the grooves of the second set being of the same depth as the grooves of the first set. The body is then further rotated relative to the cutting tool to a third position angularly spaced from each of the first and second positions by an angle of 60° as measured about the axis at right angles to the flat surface of the body. A third set of parallel, spaced grooves of triangular cross section is now formed in said surface of the body in the same manner as the first and second set of grooves, the grooves of the third set being the same depth as the grooves of the first and second sets. Finally the grooved surface of the body is used as a pattern to produce the required mould part, which can then be used in the manufacture of a reflector panel for a road vehicle.

3,748,725

METHOD AND APPARATUS FOR MANUFACTURE OF INTEGRATED CIRCUIT DEVICES

Jean M. Dupuis, Kanata, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada

Filed Apr. 28, 1971, Ser. No. 138,044
Int. Cl. B01j 17/00
U.S. Cl. 29—577 10 Claims



A mass-production technique for the fabrication of integrated circuit packages is described. The integrated circuit devices are assembled on ceramic or like substrates and the contacts for the devices bonded to the substrates, using comb-like continuous strips of contact material which are brought to a bonding station. Individual substrates are also fed into the bonding station and each substrate bonded to the contact strips, whereafter the strips and attached substrates continue through further process stages towards the finished packaged devices.

3,748,726

METHOD FOR MOUNTING SEMICONDUCTOR COMPONENTS

Richard Wiesner, Neukeferloh, Germany, assignor to Siemens Aktiengesellschaft, Munich, Erlangen and Berlin, Germany

Filed Sept. 18, 1970, Ser. No. 73,303
Claims priority, application Germany, Sept. 24, 1969, P 19 48 333.1
Int. Cl. B01j 17/00
U.S. Cl. 29—580 4 Claims

A method for connecting an integrated circuit with outside electric leads where the integrated circuit is inserted into an

insulating substrate with thereon-situated electrical conductor paths and an electrical connection is produced between the conductor paths on the substrate and the integrated circuit. The method of the invention is to bore a hole into the substrate constituting a non-etchable insulating material. The hole is filled in with an etchable material. Conductor paths are

placed upon said substrate, so that the conductor paths projects beyond the edge of the hole, filled with the etchable material. The etchable material is then etched from the hole, the integrated circuit inserted into said hole and the ends of the conductor paths which project above the edge of the hole, are electrically connected with the integrated circuit.

3,748,727

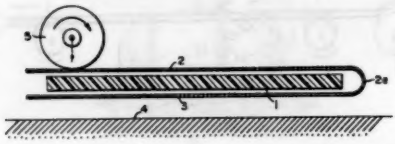
METHOD OF MAKING ELECTRET TRANSDUCERS

William H. Swain, 4662 Gleason Ave., Sarasota, Fla.

Filed July 11, 1968, Ser. No. 753,334

Int. Cl. H01s *4/00*

U.S. Cl. 29—592 **6 Claims**



Dielectric material is polarized or electrified so as to form an electret which is suited for use in a microphone or other transducer by the method which includes the steps of forming an intimate contact between the dielectric material and a conductor material and then separating these when the dielectric is cool, preferably while maintaining an electrical connection between conductors on the two surfaces of the dielectric during the separation step, without the employment of an external electric field.

3,748,728

METHOD OF MAKING GRANULAR SUPERCONDUCTORS

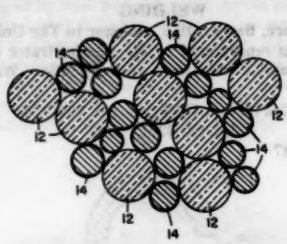
James H. P. Watson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 27,564, April 13, 1970, Pat. No. 3,650,991. This application Oct. 22, 1971, Ser. No. 191,744

Int. Cl. H01v *11/00*

U.S. Cl. 29—599 **5 Claims**

Disclosed is a method of forming a composite superconductive body comprising a porous glass matrix having a granular system of superconductive material disposed within the pores thereof. Adjacent grains of supercondcutive material are spatially separated but are electrically connected by electron tunneling. The critical field of these granular superconductors



can be modified by processing either the porous glass matrix or the molten superconductor prior to impregnation of the superconductive material into the matrix.

3,748,729

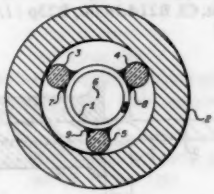
TRAVELING WAVE TUBE INTERACTION CIRCUIT MANUFACTURE

James H. Bottcher; Robert L. Pyles, both of Gainesville, Fla., and John L. Rawls, Jr., Archer, all of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 7, 1972, Ser. No. 232,563

Int. Cl. H01p *11/00*

U.S. Cl. 29—600 **7 Claims**



A helix slow wave propagation circuit supported by longitudinally aligned ceramic rods is brazed to the rods by providing seal-forming surfaces on the rods and a plating of brazing material on the helix.

3,748,730

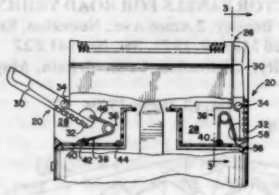
ELECTRIC RAZOR END CAP ARRANGEMENT

Nial Bartram, Wilmington, Del., and James H. Foard, Jr., Lancaster, Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed Aug. 18, 1971, Ser. No. 172,709

Int. Cl. B26b *19/38*

U.S. Cl. 30—43.1 **8 Claims**



An improved end cap arrangement for a dry shaver, such as an electric razor or the like, which includes a pair of oppositely disposed, pivotally mounted end caps, each including a spring unit associated therewith and arranged such that the caps are biased into both opened and closed positions, and tend to remain in the position to which they are moved by the

user. The end caps include upper and lower portions as well as a pair of pivot points disposed generally centrally thereof and forming a horizontally extending pivot axis. The spring is affixed at one end thereof to the lower extension of the end caps and at the other end thereof to a portion of a well formed in the razor body to accomodate the spring. In use, the spring, which includes a pair of inner and outer leg portions extending radially outwardly from an axis defined by a pair of spaced apart coils, is compressed so that the reaction force thereof urges the bottom of the end cap downwardly to maintain the upper part of the cap in a closed position, while, upon movement of the bottom portion of the end cap against the force of the spring, the entire spring is relocated within the well so that the spring urges the lower portion of the cap upwardly to an opened position of the cap unit. Since the axis of the spring moves through an arc, and the spring legs undergo a change of position in opening and closing, spring movement is very limited in relation to the permitted movement of the end caps.

3,748,731

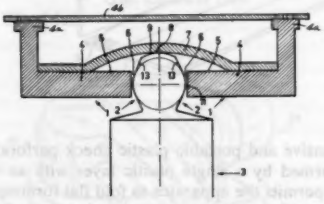
COUPLING FOR SHAVER DRIVE SHAFT AND CUTTER

Hendrik Kuiken, and Wytse Bergsma, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 842,104, July 16, 1969, abandoned. This application Aug. 30, 1971, Ser. No. 176,285

Int. Cl. B67b *7/38*

U.S. Cl. 30—43.6 **10 Claims**



A dry-shaver having a movable connection between the driving shaft and the cutting member, wherein the free end of the shaft is shaped as a coupling pin and provided with convexly curved lateral surfaces that fit bearingly in a prismatic aperture provided in a portion of the cutting member.

3,748,732

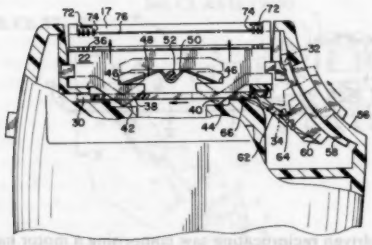
CONTROL UNIT FOR ELECTRIC SHAVER

Dale E. Frantz, Lititz, and Donald L. Shortlidge, Lancaster, both of Pa., assignors to Shick Incorporated, Lancaster, Pa.

Filed Aug. 18, 1971, Ser. No. 172,723

Int. Cl. B26b *19/02*

U.S. Cl. 30—43.1 **9 Claims**



A control unit for an electric shaver including means for controlling the degree of exposure of the cutting head and means for initiating removal of the cutting head from the razor unit for cleaning purposes. The razor unit preferably includes a pair of cutting heads, a center spacer lying adjacent the inner edges of each cutting head and a pair of positionally adjustable edge guards, one adjacent the outer edge of each head. Each guard is mounted for vertical movement to position the upper surfaces thereof more or less close to the cutting plane of the heads. Edge guard movement is controlled by movement of a control button moving in an arcuate slot, with an integral hinge arrangement connecting the button to a pair of horizontally disposed slides having cam surfaces thereon which engage inclines formed of the lower portions of the edge guide. A cutting head lifter is formed on the control assembly in a position such that movement of the control button to an extreme upward position unlocks the heads from their position of use within the razor and lifts them a short distance to facilitate removal thereof.

3,748,733

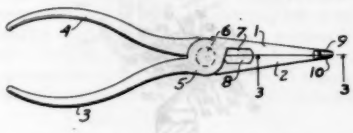
INSULATION STRIPPER FOR CONDUCTORS

Walter R. McClellan, 1515 Nuuanu Ave., Honolulu, Hawaii

Filed Oct. 18, 1971, Ser. No. 189,880

Int. Cl. H02g *1/12*

U.S. Cl. 30—90.1 **5 Claims**



The invention is a modification of a tool device such as hand pliers and the like and which is provided with means for stripping insulation from electrical conductors etc.

3,748,734

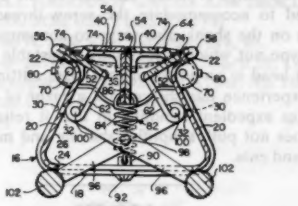
SAFETY RAZOR

Bartholomew A. Holohan, Mountainside, N.J., assignor to Tica Industries, Limited, Baltimore, Md.

Filed Nov. 3, 1971, Ser. No. 195,266

Int. Cl. B26b *21/32*

U.S. Cl. 30—60.5 **20 Claims**



An improved safety razor is disclosed having a body provided with a base portion and two opposed side portions. The base portion is provided with an operating slot and the base portion and the side portions define an operating cavity.

Biasing means connect a longitudinal portion of the bridge member to the base portion of the body for normally biasing the bridge member and a pair of toothed members (which are pivoted adjacent the longitudinal portion on wing portions of the bridge member) from a blade loading open position toward the base portion of the body and for causing the second operating lugs on a pair of blade retaining members (which are pivoted adjacent the teeth on the toothed members on the wing portions) to move away from the first operating lugs on blade retaining members and toward the base portion of the body to secure the blade between the toothed members and the blade retaining members in a blade operating closed position.

A pair of crossed levers are pivotal on each other inside the operating cavity and each has its inner end pivotally connected to a depending arm on a toothed member and its outer end extending through the operating slot in the base portion of the body. The outer ends of the crossed levers may be moved toward each other thereby causing the inner ends of the toothed members to move on the resilient body mounting lips away from the base portion of the body and the bridge member on which the inner ends of the toothed members are pivoted to move away from the base portion of the body, so that the second operating lugs on the blade retaining members move into engagement with the first operating lugs on the toothed members to cause the inner ends of such blade retaining members to move outwardly from their blade operating closed position for retaining the blade against the toothed members to their blade loading open position where the blade may be removed from the razor.

3,748,735
ANGLE HEAD SAFETY RAZOR

George E. Whittington, 1177 Walnut Dr., Enterprise, Ala.

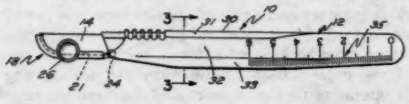
Filed Oct. 27, 1971, Ser. No. 192,998
Int. Cl. B26b *21/18*
U.S. Cl. 30—70 6 Claims

A safety razor wherein a forward or leading end of the usual type handle is provided with a reduced offset shank disposed at an angle oblique to the longitudinal axis of the handle. This shank functions to accommodate an attachable and detachable head made up of a guard plate and a complemental clamping plate. Central portions of these plates are provided with aligned openings or holes. The hole in the clamping plate is threaded to accommodate the screw-threaded shank. The threads on the shank also serve to accommodate a knurled collar-type nut which is manually adjustable to maintain the over-all head in an advantageous keen cutting but safe position. Experience has shown that a razor of the type shown promotes expedient handling in that it reliably cleaves the hair, does not pull, simplifies shaving and minimizes painful knicks and cuts.

3,748,736
SURGICAL KNIFE

Stefan Eisen, R.D.F. 2, Box 516, Danielson, Conn.

Filed Dec. 13, 1971, Ser. No. 207,109
Int. Cl. B26b *3/06*
U.S. Cl. 30—151 2 Claims

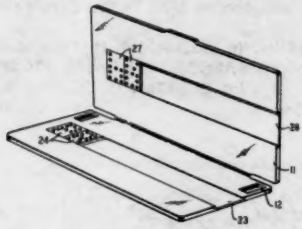


A surgical knife having a blade and a handle integrally molded on the blade. The blade has a cutting edge along at least one of its edges and an elongated knife guard having a channel formed along one of its edges mates with the cutting edge on the blade. The knife guard includes a molding runner connecting the handle to the knife guard with the molding runner also having a channel formed along one of its edges that mates with the cutting edge of the blade. Finger seats are formed on the knife guard whereby when it is desired to remove the knife guard from the blade a person may grip the knife handle in one hand and by pressing the thumb and forefinger of the other hand into the oppositely formed finger seats to secure a good grip the knife guard is pulled out of engagement with the cutting edge by a pivotal motion about the point where the molding runner meets the handle.

3,748,737
PAPER PERFORATING DEVICE

Joseph Howard Duff, 2521 Branford Ave., Union, N.J., and Paul Joseph Smith, 1138 Maple Ct., Mountainside, N.J.

Filed Mar. 30, 1971, Ser. No. 129,480
Int. Cl. B26f *1/00*
U.S. Cl. 30—358 1 Claim

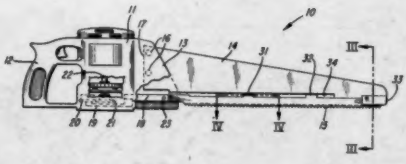


An inexpensive and portable plastic check perforating apparatus is formed by a single plastic layer with an integral hinge which permits the apparatus to fold flat forming opposing faces adapted to receive paper therebetween. Opposing faces are equipped with a pattern of rigid teeth and mating holes for perforating the check when the faces are pressed together.

3,748,738
SUPPORT MEANS FOR RECIPROCATING SAW BLADE

Carl J. Alexander, Moorepark, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed Dec. 13, 1971, Ser. No. 207,409
Int. Cl. B27b *19/08*
U.S. Cl. 30—394 5 Claims



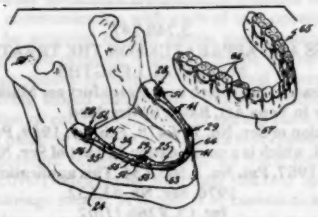
A power-driven reciprocating saw comprising a motor having a housing, a blade support arm secured on the housing at one end and provided with a blade holder at the outer end thereof, a saw blade bearing against the support member, and means drivingly connecting the blade with the motor so as to impart reciprocating motion to the blade, are disclosed.

3,748,739

ORAL IMPLANT STABILIZER AND DENTURE SUPPORT

John N. Thibert, 264 Beacon St., Boston, Mass.

Filed Oct. 4, 1971, Ser. No. 186,132
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A 8 Claims



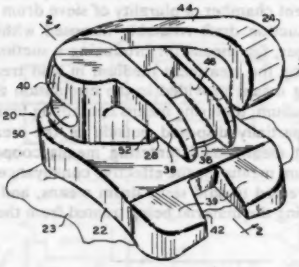
Apparatus for adjustably stabilizing dental implant blades and forming a meso-structure on which a superstructure or denture is mounted in a manner that the denture is not directly supported by the gingival tissue of a patient's jaw.

3,748,740

ORTHODONTIC BRACKET

Alexander J. Wildman, Eugene, Oreg., assignor to Consyne Corporation, Glendora, Calif.

Filed May 5, 1972, Ser. No. 250,574
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A 17 Claims



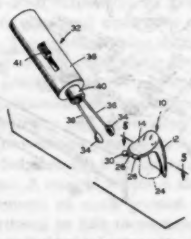
Improved orthodontic brackets include bodies having retainer hooks forming arch wire receiving eyes with either a groove in the head alone or with the groove and a C-ring spring which acts to lock the hook in its closed position and permits deliberate opening of the hook.

3,748,741

MODEL FOR TOOTH COLOR MATCHING

John G. Yerkes, Jr., 36 Gillett St., Hartford, Conn.

Filed June 8, 1972, Ser. No. 260,724
Int. Cl. A61c *19/00*
U.S. Cl. 32—71 8 Claims



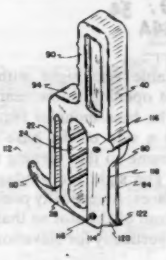
Models for tooth color matching include a body member and a handle on which the body member is pivotally mounted. The body member is adapted for placement in a patient's mouth in front of a prepared tooth, and has a sidewall portion with a generally concave inner surface providing an obstruction-free central area to accommodate the prepared tooth; an enamel-simulating veneer material may be provided on the body member if so desired.

3,748,742

CUTLERY TOOL

David A. Bigler, 4603 Belmour Way; Boyd R. Bigler, 1791 Oakridge Dr., both of Salt Lake City, Utah, and Owen G. Bigler, 1321 Creek Rd., Sandy, Utah

Filed Sept. 16, 1971, Ser. No. 180,989
Int. Cl. B26b *29/00*
U.S. Cl. 30—294 6 Claims



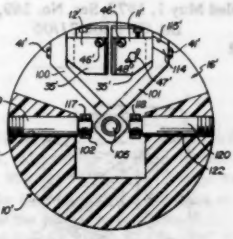
A cutlery tool having a rigid body and a centrally disposed handhold therein. A sharpened blade is situated so as to have an exposed cutting surface at the leading or front edge of the tool. In one preferred embodiment a forwardly tapered tongue is integral with the tool adjacent the bottom edge thereof beneath the blade. In another presently preferred embodiment a rearwardly projecting tapered member is integral with the body. If desired, a secondary handle can be formed in vertically stacked relation above the body.

3,748,743

BOWLING BALL HANDGRIP GAUGE AND DRILLING JIG FOR USE THEREWITH

Fred G. Simon, 906 N. 15th Ave., Melrose Park, Ill.

Continuation-in-part of Ser. No. 30,836, April 20, 1970, abandoned. This application July 27, 1971, Ser. No. 166,427
Int. Cl. A61b *5/10*; G01b *5/24*
U.S. Cl. 33—174 F 3 Claims



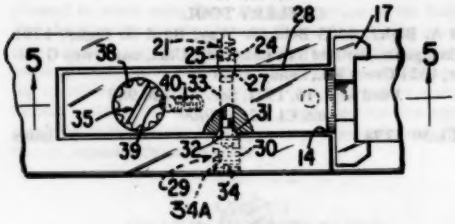
A dummy bowling ball including a pair of finger adjustment assemblies and a thumb adjustment assembly which can be adjustably positionable in accordance with the natural span of a bowler's hand and the pitch and angle to the natural grip of the bowler.

3,748,744

ADJUSTABLE REAR SIGHT FOR HANDGUNS

Douglas S. McClenahan, Southport, Conn., assignor to Charter Arms Corporation, Bridgeport, Conn.

Filed Dec. 30, 1970, Ser. No. 102,829
Int. Cl. F41g 1/26
U.S. Cl. 33—257 2 Claims



A handgun adjustable rear sight with a base pivotally mounted within a slot opening to the rear of the gun frame. The pivoted axis of the base includes two pins with one pin spring biased against a side of the base and the other pin threaded in the gun frame so that turning the second pin will laterally position the gun sight for windage adjustment. The pins have conical surfaces. A vertically positioned screw in the base engages the bottom of the slot so that turning the screw will position the sight vertically for elevation adjustment.

3,748,745

DYESTUFF MANUFACTURE

George Sachs; Anthony Kenneth Dunn, and William Frederick Skuce, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 29, 1971, Ser. No. 203,045
Int. Cl. F26b 3/08
U.S. Cl. 34—10 1 Claim

A process for the isolation of an edible water-soluble azo dyestuff, comprising subjecting an aqueous solution or suspension of the dyestuff to atomisation by delivery of the solution or suspension on to a high speed rotating disc, in the presence of a stream of gas which is chemically inert towards the dyestuff and which is heated to a temperature in the range 200°–400$\pi\zeta$ c.

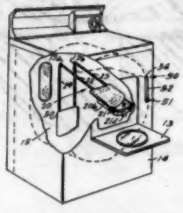
The products are particularly suitable for dry mixing into powdered foodstuff materials.

3,748,746

LINT SCREEN FOR DRYER

William F. Robandt, Saint Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 1, 1972, Ser. No. 249,128
Int. Cl. F26b 21/06
U.S. Cl. 34—82 13 Claims



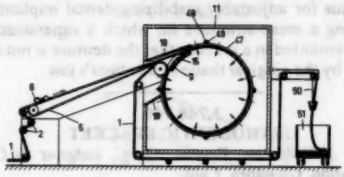
A lint filter for a clothes drying apparatus comprises a filter element on a mounting means pivotally attached to a stationary rear wall of a dryer within the diameter of the revolvable drum rear opening through which air exiting from the drying chamber is directed for removal of lint. An operating means on the dryer cabinet adjacent the front opening pivots the filter means forwardly and upwardly to an accessible position adjacent the front opening so that the filter element may be removed for cleaning.

3,748,747

PROCESS AND APPARATUS FOR THE TREATMENT OF MATERIAL LENGTHS

Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland

Division of Ser. No. 799,478, Feb. 14, 1969, Pat. No. 3,605,280, which is a continuation-in-part of Ser. No. 654,728, July 20, 1967, Pat. No. 3,503,134. This application Apr. 30, 1970, Ser. No. 43,632
Int. Cl. F26b 11/02
U.S. Cl. 34—122 3 Claims



The present disclosure is directed to a process and apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, and outlet means for removing the material being treated from the treatment chamber.

3,748,748

VOICE PUZZLE GAME

Jane Bevan, and Brian Bevan, both of 356 Gilbert St., Ridgewood, N.J.

Filed Dec. 30, 1971, Ser. No. 214,047
Int. Cl. G09b 5/04
U.S. Cl. 35—8 A 50 Claims

The essence of the invention resides in a voice puzzle having a board with a plurality of varied shaped openings therein. Each of said varied shaped openings having a word, sound or

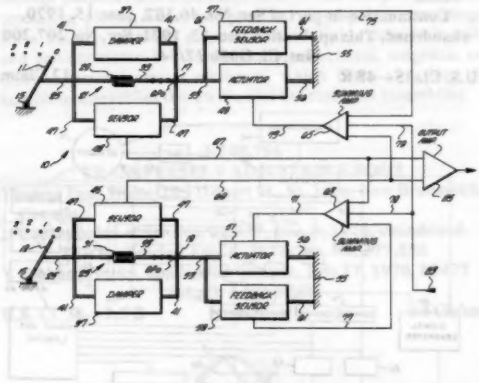
phrase associated therewith. A lower housing member supports said board. A plurality of varied shaped puzzle pieces having the same shapes of the varied shaped openings as provided are insertable therein. Each puzzle piece is adapted to fit into only one opening in the board having the same shape as the puzzle piece, each of said puzzle pieces having a word, sound or phrase associated therewith. A pressure responsive means is in communication with each of said openings and is adapted to be actuated by said puzzle piece associated with the opening when pressure is applied to the puzzle piece. A voice storage means is disposed within said lower housing member having stored thereon in discrete sections a vocal representation of each word, sound or phrase associated with each puzzle piece. A voice pick-up means is in communication with each pressure responsive means for each puzzle piece and is selectively engageable with said discrete sections on said voice storage means. A motor is in communication with said voice storage means with electrical circuit means for activating said voice storage means engageable with said pressure responsive means and also means is connected to the voice pick-up means for transmitting audible sound which is stored on said voice storage means to the user, by way of an amplifier and/or speaker.

3,748,749

ELECTRICALLY SYNCHRONIZED CONTROLLERS

Richard G. Buscher, Woodland Hills, and Richard L. Davis, Pacific Palisades, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 30, 1971, Ser. No. 214,138
Int. Cl. G09b 9/02
U.S. Cl. 35—11 **26 Claims**



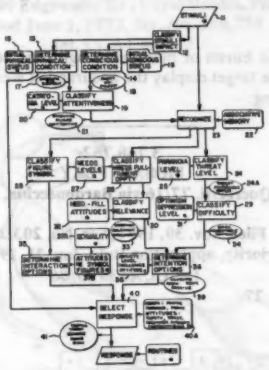
A multiple hand controller system is disclosed having redundant systems for synchronizing the movements of the hand controllers. In one embodiment, the hand controller system comprises a pair of movable hand controllers. Each hand controller is coupled to a movable ground point to be movable in two modes. The first mode is where the hand controller moves with respect to its ground point. The second mode is where the hand controller moves as a unit with its ground point. The synchronizing system comprises two sets of components. Each set includes an actuator for varying the location of the ground point of one hand controller. Each set includes a first sensor for sensing the first mode of movement for one hand controller and generating an input signal porportional to this movement. The input signal from the first sensor of each set is fed, through a summing amplifier, to the actuator of the other set. A second sensor is also provided for monitoring the movement of each ground point and generating a signal proportional to this movement. The signal from each second sensor is fed back to the summing amplifier controlling its respective actuator to be algebraically summed with the input signal from the first sensor to generate an output signal. This output signal is fed to the respective actuator to command the actuator to move the ground point location of its connected hand controller an amount representative of the movement of the other hand controller. This cross synchronization enables the movement of one hand controller in the first mode to affect a representative movement of the other hand controller in the second mode.

3,748,750

BEHAVIOR SIMULATOR

Peter E. Viemeister, 14 Baywood Ln., Bayport, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,113
Int. Cl. G09b 9/00
U.S. Cl. 35—22 R **13 Claims**



A simulator of human behavior includes logic circuitry which is selectively adjustable to represent human characteristics on a relative value scale. Encoded representations of human situational stimuli are inputted to the simulator through a card reader. The cards have pictorial representations of objects or scenes, sounds and people or beings thereon. They are made of a transparent material so that the visual representations on a number of cards can be viewed simultaneously when they are placed in the card reader. Visual output indicators represent a plurality of different behavioral responses to the input stimuli. The output responses range between an aggressive response and a retreat response. The input stimuli are connected through the logic circuitry to selectively actuate different ones of the output responses.

3,748,751

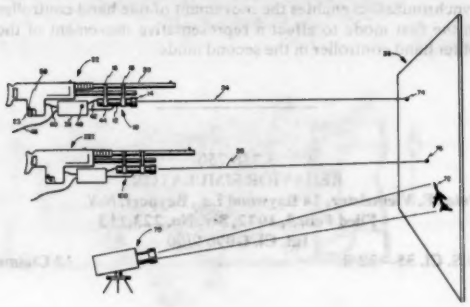
LASER MACHINE GUN SIMULATOR

Denis R. Breglia, Altamonte Springs; Alfred H. Rodemann, Maitland, and Windell N. Mohon, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 7, 1972, Ser. No. 287,120
Int. Cl. F41g 3/26
U.S. Cl. 35—25 **5 Claims**

A laser, automatic fire weapon (machine gun) trainer, comprising a laser, automatic fire weapon simulator including a high intensity visible laser light source, a rotating disc shutter means for producing from the light source a beam cyclically modulated to simulate the normal rate of fire of the weapon and a switch controlled ray interrupting second shutter means

actuated from the weapon trigger to manually control the bursts of simulated fire, together with target display means for



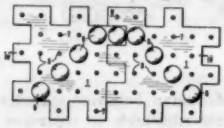
receiving the bursts of modulated light beams to visually indicate on the target display the accuracy of weapon manipulation and firing.

3,748,752

MOSAIC PLAY

Alessandro Quercetti, 77/16 via Bardonecchia, I-10139 Turin, Italy

Filed Nov. 30, 1971, Ser. No. 203,235
Claims priority, application Italy, Jan. 21, 1971, 67209-A/71
Int. Cl. A63h *33/08*
U.S. Cl. 35—27 **4 Claims**



A mosaic play of the type comprising a base plate with holes and a number of mosaic elements intended to be inserted in the holes of the base plate, wherein the base plate comprises a number of plate elements. Each plate element is made of slightly flexible synthetic material and its sides are indented in the form of castellations for allowing connection with adjacent plate elements, so that base plates of any shape and size may be formed by mutually joining the plate elements shaped in this manner.

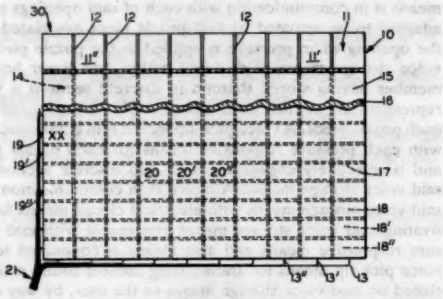
3,748,753

ELECTRO-OPTIC DEVICE FOR IMPROVING READING ABILITY

Elmer W. Whitcomb, 74 E. Rogues Path, and Joseph W. Raba, 30 Peachtree Ln., both of Huntington, N.Y.

Filed Feb. 15, 1972, Ser. No. 226,459
Int. Cl. G09b *17/02, 17/04*
U.S. Cl. 35—35 B **12 Claims**

An electro-optic device for improving reading ability comprises reading matter over which is placed a pair of parallel transparent insulating plates forming a sandwich, each of the plates being coated on the inside surface with a spaced array of parallel closely-spaced transparent electrode bands, the direction of the bands on one plate being disposed perpendicularly to and insulated from those on the other, the electrode crossings thus forming a series of rows of separate reading panels disposed in register with the reading matter. A thin layer of transparent insulating material covers the coated surface of at least one plate and a thin layer of transparent nematic liquid crystal composition capable of entering a stage of non-destructive opacity, when subjected to a threshold voltage, is disposed between the plates. A source of voltage is provided to impress a variable voltage across the electrodes, the voltage ranging from below the threshold value of the nematic liquid to a voltage above the saturation value, and sequential switching means is connected between the voltage source and



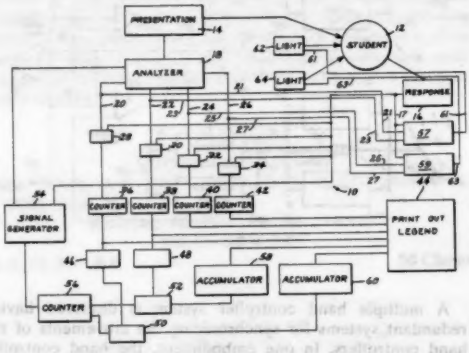
the electrodes and it is designed, first, to impress at least a saturation voltage on the panels whereby they become opaque with respect to the reading matter, and then sequentially to reduce the voltage on the panels to below the threshold value, in reading relation, whereby the panels are made sequentially transparent.

3,748,754

METHOD AND APPARATUS FOR SIMULTANEOUSLY TEACHING AND TESTING A STUDENT

David L. LaBerge, 2410 Sherwood Hills Rd., Minnetonka, Minn.

Continuation-in-part of Ser. No. 46,182, June 15, 1970, abandoned. This application Dec. 13, 1971, Ser. No. 207,200
Int. Cl. G09b *17/04*
U.S. Cl. 35—48 R **12 Claims**



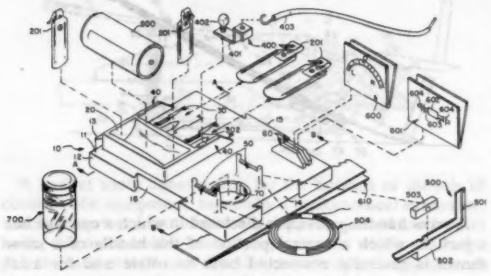
This invention is a machine and a method of machine operation for teaching and testing identification and comprehension of stimulus patterns and to improve the speed of doing same by providing a repeated presentation of target symbols, corresponding to an initial cue symbol, to which the student is expected to respond positively, and occasional catch symbols to which the student is to make no response, and thereafter providing an immediate readout indicating the performance on a test run for the student and instructor. The system measures performance in terms of the average response time for correct responses and the number of correct responses as well as the number of incorrect responses. The immediate readout of student performance is provided so that particular learning difficulties may be identified at once and allow the student to correct his particular problem, thereby optimizing his learning rate. The subject's performance on new material is compared against his performance on well-learned material over a period of practice to indicate progress made.

3,748,755

CIRCUIT BASE MODEL

Robert Karplus, Orinda; Marshall A. Montgomery, Pleasant Hill, both of Calif., and Carl F. Berger, Livonia, Mich., assignors to The Regents of the University of California, Berkeley, Calif.

Filed June 19, 1972, Ser. No. 259,536
Int. Cl. G09b 23/18
U.S. Cl. 35—19 A 7 Claims



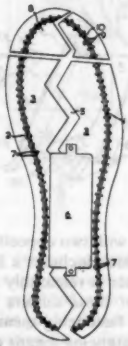
Principles of electricity, magnetism and electrochemistry, together with more fundamental concepts of scientific method and abstract reasoning, can be taught to children with the aid of simple, economic models. Disclosed here are a standard repeating unit of circuit board in the form of a raised platform which can be mated edge-to-edge with like circuit boards for building-up circuits or stacked in a nesting arrangement for storage purposes and which is of economical one piece formed insulating plastic sheet, yet provides appropriate mountings for a battery, terminal strips, terminal clips, electrolytic cell, and galvonometer; the corresponding electrical, magnetic or electrochemical circuit elements, which form a variety of complete assemblies therewith; and the resultant assemblies.

3,748,756

TRANSVERSELY ADJUSTABLE BOOT

Thomas Paul White, 109 Gilbert St., St. John, New Brunswick, Canada

Continuation of Ser. No. 94,927, Dec. 3, 1970, abandoned.
This application Aug. 4, 1972, Ser. No. 277,858
Claims priority, application Canada, July 17, 1970, 88477
Int. Cl. A43b 00/00
U.S. Cl. 36—2.5 B 24 Claims



In an athletic boot comprising a base portion, a lateral side portion, a medial side portion, and a toe portion, said base portion including an insole and an outer sole, said side portions including a high top shoe quarter, vamp and counter and being joined at the rear of the boot to each other, at the front of the boot to said toe portion, and at the base of said boot to said base portion, and said toe portion being joined to the base of said boot, the improvement in which the lateral side portion is connected to a part of said base portion which is separate from the part of said base portion to which said medial side portion is attached whereby on assembly of said boot, said side portions may be adjusted transversely to provide for a more accurate fit to the foot of the wearer. The toe portion is preferably removably secured to the side and base portions, so that the full toe vamp can be placed inside the side portions and the insole toe piece abutted against the remainder of the insole and secured in this position for fitting or refitting to the wearer's foot. The counter is constructed so as to allow it to pass around a portion of the protruding ankle bones, or if desired completely surround the ankle bone to provide a firmer fit to the sides of the foot.

3,748,757

SANDAL

Samuel Silver, 90 Edgewater Dr., Coral Gables, Fla.

Filed June 1, 1972, Ser. No. 258,754
Int. Cl. A43b 3/12
U.S. Cl. 36—11.5 8 Claims

A sandal comprised of a sole portion, including an insole and an outsole adhesively fixed together, an upstanding thong which is adapted to lie between two toes of the wearer and an enlarged decorative top portion, carried by the top of the thong, which is sized to overlie a portion of the toes and to extend rearwardly at least a portion of the way along the instep of the foot, said thong includes a lower portion, extending through the insole, and an enlarged lower end which is captivated and held firmly in place between the bonded insole and outsole. Adjustable strap means are provided to engage around the ankle area of the wearer.

3,748,758

FOOTWEAR HAVING TRANSPARENT PARTS

Le Ann Bartok Wilchusky, 125 Penhurst Dr., Pittsburgh, Pa.

Filed Nov. 19, 1971, Ser. No. 200,417
Int. Cl. A43b 23/26
U.S. Cl. 36—34 A 11 Claims

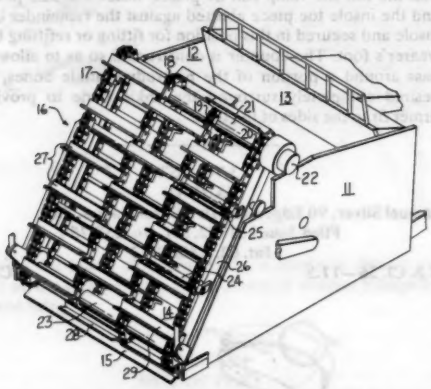
Footwear including a portion having a layer comprising a temperature or pressure sensitive liquid crystal system which changes color when the footwear flexes, as when the wearer walks. Footwear made at least partly of a transparent plastic material is preferred.

3,748,759

MULTI-FLIGHT CONVEYOR FOR SELF-LOADING SCRAPERS

Richard K. Liess, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 16, 1971, Ser. No. 208,623
Int. Cl. B60p *1/36*
U.S. Cl. 37—8 7 Claims



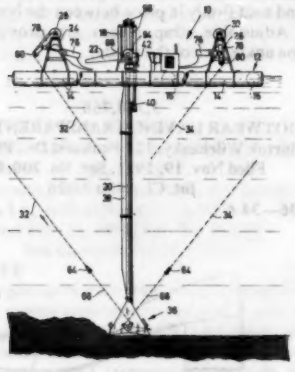
An elevator assembly is mounted on a bowl of a self-loading scraper and comprises a plurality of endless chains having transversely disposed flight members secured thereto. The flight members are arranged in three vertically aligned groups with each of the groups being positioned in an offset, staggered relationship with respect to each of the other groups.

3,748,760

DREDGING MACHINERY WITH SWINGING DOUBLE ENDED SCOOP

Ludwig Lorenz Schnell, Aufhausen, Germany, assignor to Schuttgutforderlechnik AG, Zug/Schweiz, Switzerland

Filed Dec. 14, 1971, Ser. No. 207,923
Claims priority, application Germany, Dec. 28, 1970, P 20 63 968.3
Int. Cl. E02f *3/92*
U.S. Cl. 37—58 10 Claims



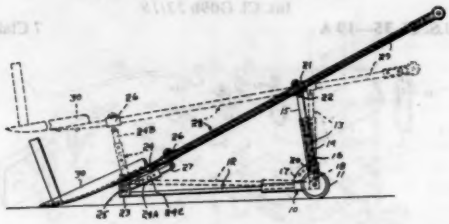
A floating dredge has a downwardly extending discharge line terminating in a double ended scoop, with the discharge line being supported at its upper end for bi-directional swinging movement of the scoop; the scoop having a pivoted double ended scraper blade which alternatively opens one end of the scoop while closing the other.

3,748,761

SNOW HANDLING DEVICE

Clyde H. Chetwynde, 56 Chapel St., Duxbury, Mass.

Filed June 15, 1972, Ser. No. 262,954
Int. Cl. E01h *5/02*
U.S. Cl. 37—130 9 Claims



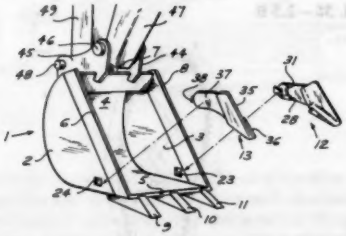
A snow handling device is disclosed in which a carriage has a jack to which a central portion of the handle of a snow shovel is pivotally connected both to rotate and for axial movement relative thereto and a forward extension to which the handle is connected by a link permitting the handle to be turned but limiting its axial movement. When the shovel is full, the operator depresses the rear portion of the handle with the lifting of the shovel enabling the device to be easily moved and also erecting the link to hold the shovel in an elevated position relative to the forward extension. The jack may then be operated by again raising the rear portion of the handle to establish a higher dumping position of the shovel.

3,748,762

EXCAVATOR BUCKET WITH DETACHABLE SIDE CUTTERS

John Tarrant, Southminster, England, assignor to Bofors (Great Britain) Co. Ltd., Bamsden Heath, Billericay, Essex, England

Filed June 15, 1972, Ser. No. 263,160
Claims priority, application Great Britain, June 25, 1971, 29,837/71
Int. Cl. E02f *9/28*
U.S. Cl. 37—141 T 13 Claims



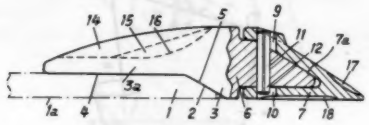
An excavator bucket with two opposite side walls and an intermediate wall part which includes a forward lower edge of the bucket. A side cutter is releasably attachable to each of the side walls. Each of these cutters has a bracket which mounts at its free end fastening means arranged to co-act with complementary fastening means on the respective side wall of the bucket to locate the cutter on the bucket. Each cutter further has abutment means engageable with edge portions of the bucket to locate the forward part of the cutter. The bracket also carries an abutment disposed opposite an abutment on the respective side wall of the bucket. Wedges are insertable between the abutments on the bracket and the respective side wall to lock the side cutters in position.

3,748,763

BUCKET TOOTH CONSTRUCTION FOR THE BUCKETS OF CONSTRUCTION EQUIPMENT

Hans-Rudolf Zepf, Glarnischstrasse 15, Ruschlikon, Switzerland

Filed June 7, 1971, Ser. No. 150,572
Claims priority, application Switzerland, June 9, 1970, 8624/70
Int. Cl. E02f 9/28
U.S. Cl. 37—142 R 8 Claims



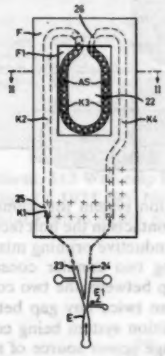
A bucket tooth construction for the buckets or shovels of construction equipment, especially a bucket-wheel excavator, which comprises a tooth holder or support secured to a bucket knife, this tooth holder embodying a portion which protrudes past the bucket knife and at which there is detachably secured a tooth cap. According to specific aspects of this invention the portion of the tooth holder which does not protrude past the bucket knife is welded to the inside of the bucket knife and such portion is at least equal in length to the protruding portion of such tooth holder. Further, the largest profile or section of the tooth holder approximately corresponds to the largest profile or section of the tooth cap.

3,748,764

PNEUMATIC DISPLAY

Max Schilter, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Sept. 29, 1971, Ser. No. 184,688
Claims priority, application Switzerland, Oct. 27, 1970, 15853/70
Int. Cl. G09f 11/06
U.S. Cl. 40—37 5 Claims



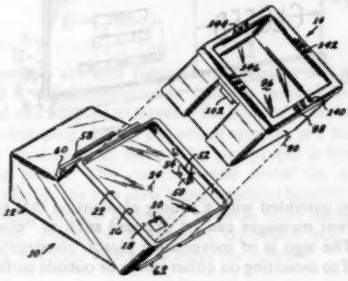
A pneumatic display device, comprising a plate block embodying a plurality of superimposed transparent plates, each of these plates being provided with means defining a disc guide channel. Each disc guide channel has a first air channel followed by a supply section for a plurality of non-transparent display discs displaceably arranged in a row therein, a display section following such supply section, said display section being in the form of a trace line for symbolizing a character at the region of a display zone limited by a display window provided at a non-transparent cover plate of the plate block. At the end of the display section such merges into a second air channel. Upon blowing air into the first air channel of a preselected plate the display discs thereof are displaced out of the supply section thereof into the display section thereof and thereby become visible at the display zone in the form of a desired character and upon further blowing air into the second air channel these display discs are again forced back into the supply section of the relevant disc guide channel.

3,748,765

ILLUMINATED EDUCATIONAL PICTURE VIEWER TOY

Sidney Bass, Los Angeles; John T. Benson, Encino, and Darold M. Shirwo, Beverly Hills, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 7, 1972, Ser. No. 216,217
Int. Cl. G07f 11/30
U.S. Cl. 40—63 A 10 Claims



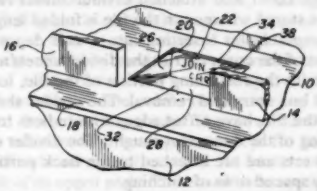
Pictorial transparency has one picture located in each corner intermediate the bottom wall and top of a square, hollow cube having its bottom wall provided with an aperture beneath each picture and its top closed by a translucent viewing screen upon which each picture may be viewed separately by positioning the cube in a square viewer having an aperture in one corner in a position such that one cube aperture and its associated picture will be juxtaposed over viewer aperture when cube is placed in viewer. A light bulb is illuminated beneath the viewer aperture when cube closes switch. Next picture may be viewed by removing cube, rotating cube one-quarter turn and replacing cube in viewer.

3,748,766

DEAL PLATE

Vernon S. Hoesch, 140 S. Wright St., Naperville, Ill.

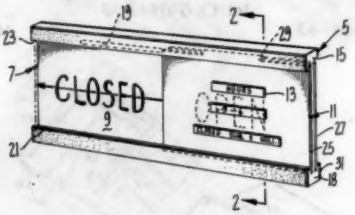
Continuation of Ser. No. 813,569, April 4, 1969, abandoned. This application July 26, 1971, Ser. No. 164,842
Int. Cl. G09f 11/30
U.S. Cl. 40—63 R 2 Claims



A counter for a teller's cage and the like having a transparent top section covering a recess provided with an inclined wall upon which is affixed a message or other indicia in a plane substantially normal to the line of vision of a patron or customer. The size of inclined wall in relation to the depth of the recess and the area or length of the transparent top section are such that the message or indicia are clearly visible to the patron with no interfering reflections from the surface of the

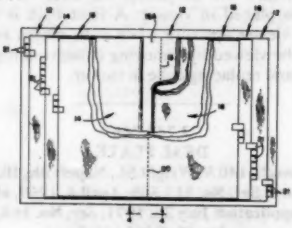
transparent section at all normal viewing angles. In one embodiment a slot is provided for ready insertion and withdrawal of the indicia in printed card form. In another embodiment the inclined wall is transparent or transluscent and means are provided to transmit the indicia therethrough as a projected or moving image. Other embodiments are disclosed.

3,748,767
CLOSED-OPEN SIGN
Albert S. Giesecke, 400 Montgomery St., San Francisco, Calif.
Filed June 23, 1971, Ser. No. 155,777
Int. Cl. G09f *11/30*
U.S. Cl. 40—65 **1 Claim**



A sign is provided with a sliding element so that either of two different messages can be exposed such as "closed" or "open". The sign is of inexpensive plastic construction and lends itself to mounting on either inside or outside surfaces.

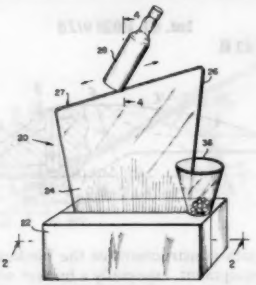
3,748,768
FOLDABLE FILE FOR SAFE DEPOSIT BOX
Frances L. Strowger, 100 N. W. Quality Way, Portland, Oreg.
Filed July 28, 1971, Ser. No. 167,075
Int. Cl. B42f *7/06*
U.S. Cl. 40—104.03 **1 Claim**



A file entirely of cloth construction for the orderly, nondamaging storage of documents within a safe deposit box. A flexible cloth cover and attached divider sheets receive the papers to be stored whereupon the file is folded lengthwise to a width acceptable for insertion into a safe deposit box. A back portion of the cover carries the divider sheets and is flexible, along with the remaining portion of the file, to facilitate safe deposit box entry and removal. The divider sheets, upon opening of the file, have offset edges with indices to promote rapid locating of the document sought. The divider sheets are arranged in sets and are attached to the back portion of the file cover by spaced rows of stitching.

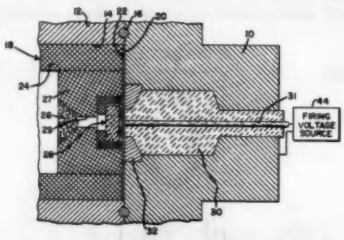
3,748,769
ANIMATED DISPLAY DEVICE
Anthony Nolles, 115 E. 89th St., New York, N.Y.
Filed Oct. 1, 1971, Ser. No. 185,555
Int. Cl. G09f *11/12, 13/18*
U.S. Cl. 40—106.52 **9 Claims**

An animated three-dimensional display having a pellucid panel member supported by a pedestal. An object or article to be displayed is attached to a movable conveyor aligned peripherally around an edge of the panel member. The conveyor is visually concealed, especially when viewed perpendicularly to the plane in which the panel member is located, preferably by means of internal light transmission through the panel member which illuminates the edge and thereby screens



the conveyor. A motor and drive arrangement for propelling the conveyor and a light source for illuminating the panel member are housed within the pedestal. The pedestal is constructed with frictionally interlocking parts to facilitate disassembly thereof and to permit accessibility to the elements housed therein.

3,748,770
AMMUNITION HIGH VOLTAGE ELECTRICAL IGNITION SYSTEM
James W. Mitchell, Philadelphia, Pa., assignor to General Electric Company, Burlington, Vt.
Division of Ser. No. 863,076, Oct. 2, 1969, Pat. No. 3,608,492.
This application Apr. 5, 1971, Ser. No. 131,404
Int. Cl. F41c *19/12*
U.S. Cl. 42—84 **5 Claims**

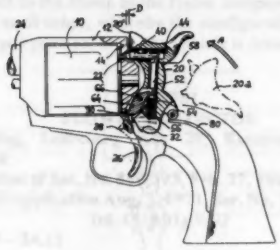


An electrical ignition system for ammunition that utilizes two fixed electrical contacts in the bolt face; and a primer having an electrically conductive priming mix, and a consumable dielectric disc having two annular consumable conductors therethrough, the gap between the two conductors being significantly greater than twice any gap between the bolt face and the disc, the ignition system being completed and energized by a high voltage power source of sufficient voltage to overcome any air gap between the cartridge and the bolt face.

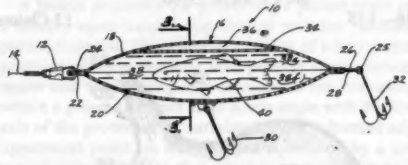
3,748,771
SAFETY DEVICE FOR OBSOLETE FIREARMS
Armando Piscetta, 4 Via Macerata, 20139 Milan, Italy
Filed Oct. 12, 1971, Ser. No. 188,248
Claims priority, application Italy, Oct. 12, 1970, 30868 A/70
Int. Cl. F41c *17/04*
U.S. Cl. 42—66 **10 Claims**

In a typical XIX Century revolver of the type having an unsafe half-cocked safety system, in which a firing pin is movably

supported within the hammer, so that any unduly forward motion of said hammer cannot cause the pin to strike on the cartridge primer, and including a mechanism which locks said firing pin to said hammer only when the trigger is acted upon for firing the revolver.

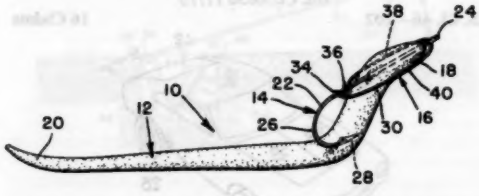


3,748,772
FISH LURE
Elmer W. Gravitt, 4237 N.W. 11th Ct., Des Moines, Iowa
Filed Sept. 13, 1971, Ser. No. 179,720
Int. Cl. A01k *97/04*
U.S. Cl. 43—41 **1 Claim**



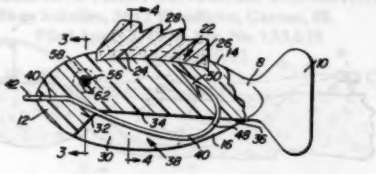
First and second transparent housing members are pivotally secured together at one end by a U-shaped element to form a hollow minnow compartment. The upper one of the housing members is provided with an air compartment and each of the members are formed with water passages. A fishhook is connected to the U-shaped pivot element and to the bottom one of the members. The end of the members opposite to the pivoted end are held by a snap fastener connected to a leader.

3,748,773
FISHING LURE
David Langston Goforth, 613 W. Kemp Rd., Greensboro, N.C.
Filed Dec. 27, 1971, Ser. No. 211,985
Int. Cl. A01k *83/06, 85/00*
U.S. Cl. 43—42.1 **8 Claims**



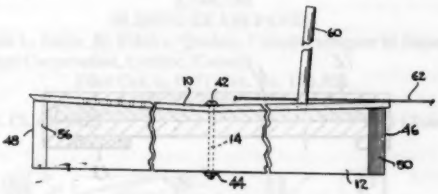
A fishing lure including a flexible body having a head portion with the shank of a fishhook passing therethrough. A resilient retainer member is attached to the shank, adjacent the ends, for preventing disengagement of the body from the hook after a fish has seized the lure.

3,748,774
PLASTIC MINNOW
Sherman G. Bryant, Rt. No. 3, Lewisport, Ky.
Filed Dec. 21, 1971, Ser. No. 210,469
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.1 **6 Claims**



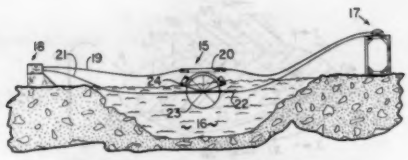
A weedless artificial fishing lure designed and adapted to provide a self-shape-retaining minnow molded from plastic material and adapted to traverse the body of water in a desired bottom-bumping manner but which remains in a ture life-like upright position at all times. The lure proper is made of soft sinkable plastic. The complemental dorsal fin is made of floater plastic, the two parts being joined or bonded to achieve the constant upright swimming position while being retrieved or trolled. The hook is normally concealed but readied to function when the victim fish takes the minnow.

3,748,775
TROLLING BOARD
Arthur E. Wagner, 400 S. Plumas, Willows, Calif.
Filed May 12, 1971, Ser. No. 142,552
Int. Cl. A01k *91/00, 93/00*
U.S. Cl. 43—43.13 **10 Claims**



A substantially rectangular board, having a rudder postioned diagonally across the bottom, adapted to float in a moving water current and attached to the shore or a boat, whereby the relatively moving current striking the diagonally positioned rudder forces the board away from the shore or boat and into the stream, while the restraining line prevents the board from floating away. The downwardly extending rudder is substantially rectangular, except for its upper edge being inclined downwardly toward the center of the rudder from both of its upper ends. The board is clamped to the upper edge of the rudder, causing the board to assume an arc substatnially conforming to the configuration of the inclined area of the rudder. An upstanding post positoned on the board is adapted to snag a trolling line, the trolling line extending from the bank or boat around the post and downstream from the board, the post preferably being slightly canted in a downstream direction, whereby a lure is trolled downstream from the board and a fisherman on the bank may disengage the fishing line from the canted upstanding post by a flick of the wrist when a fish is on the lure.

3,748,776
FISH AND BAIT TRAP
Walter F. Mueller, 301 Pon St., Ballinger, Tex.
Filed Oct. 24, 1972, Ser. No. 299,916
Int. Cl. A01k *69/06*
U.S. Cl. 43—103 **9 Claims**

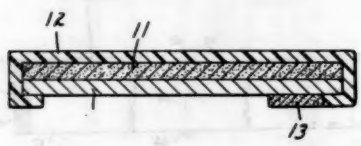


A floating fish and bait trap assembly having a cylindrical cage within which fish may live when trapped therein.

A shelter having spaced floats thereon is superimposed over the cage in journaled relationship therewith to enable the cage to be rotated relative to the shelter, and further to protect the cage from the elements.

A yoke is attached to and depends away from the journal means for enabling the apparatus to be manipulated in the water and on the land. The apparatus can be beached, and then pulled along the beach with the cage supporting the apparatus in a manner similar to a wheeled vehicle.

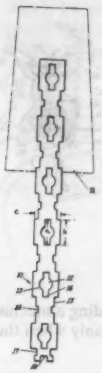
3,748,777
WATER-ACTIVATED INSECT TRAP
Thomas Ian Bradshaw, Shoreview, and Morgan J. Tamsky, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Mich.
Filed May 15, 1972, Ser. No. 253,164
Int. Cl. A01m *1/18*
U.S. Cl. 43—114 **4 Claims**



A strip useful for the entrapping of insects is formed comprising a carrier having coated thereon a normally tacky insect-entangling substance, the surface of said tacky substance being covered with a nontacky material which is cold water soluble, said nontacky material being removed when wet with water, thereby exposing said tacky material. The strip can be used as a tree band for trapping crawling insects or freely hanging for flying insects.

3,748,778
INTERLOCKABLE STICKS FOR CONFECTIONS
Alan David Ellies, and Richard E. Cone, 2nd, both of 1327 W. King Ave., Columbus, Ohio
Filed Sept. 27, 1972, Ser. No. 292,817
Int. Cl. 99 *138 S*; A63h *33/08*
U.S. Cl. 46—28 **7 Claims**

A rectangular stick of a substantially uniform thickness for mounting a frozen comestible comprising apertures disposed in spaced relationship along the stick, each aperture including a circle and a pair of diametrically opposed notches disposed along the axis of the stick; a pair of transverse notches between apertures having a depth equal to the thickness of the stick and a longitudinal dimension equal to the width of the stick; and a pair of transverse slots disposed between apertures

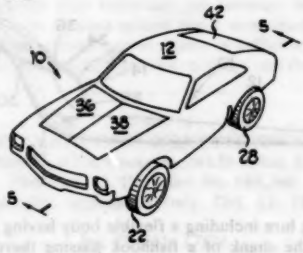


and centered within the pair of transverse notches having a longitudinal dimension equal to the thickness of the bar.

3,748,779
TOY ANIMAL FIGURE
Ester Cherk, and Garry D. Wyckoff, both of 522 Cascade Dr., Mill Valley, Calif.
Filed Sept. 1, 1971, Ser. No. 176,946
Int. Cl. A63h *13/00*
U.S. Cl. 46—115 **13 Claims**

A soft manipulatable figure toy comprising a flexible cover, or body material, defining an animal form and including a fluent particulate partial filler comprising a non-toxic, edible cereal grain.

3,748,780
TOY VEHICLE
Marvin I. Glass, Chicago; Howard J. Morrison, Highland Park; Donald F. Nix, Hanover Park, and Robert K. Allen, Frankford, all of Ill., assignors to Martin Glass & Associates, Chicago, Ill.
Filed Mar. 3, 1972, Ser. No. 231,517
Int. Cl. A63h *11/10*
U.S. Cl. 46—202 **16 Claims**



A toy vehicle including a body having a frame which supports rolling and driving wheels, with the frame being in two

portions that move relative to each other and a motor means on one of the frame portions for moving the frame portions relative to each other and driving the driving wheels, with the body having portions interrelated to the frame, so as to move with respect to the frame as the frame components move with respect to each other, whereby the configuration of the vehicle is changed prior to, or as, the vehicle is driven.

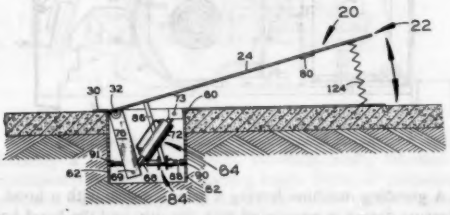
3,748,781
FLOWER PROTECTOR
John Erling, Ledreborg Alle 20, Rasmussen, Gentofte, Denmark
Continuation of Ser. No. 853,393, Feb. 27, 1969, abandoned. This application Aug. 3, 1971, Ser. No. 168,570
Int. Cl. A01g 9/02
U.S. Cl. 47—34.11 **1 Claim**

A flower protector for protecting a potted plant comprising a unitary open-topped cup-shaped member formed of transparent material. The member consists of bottom and side wall portions wherein the side wall portion flares outwardly at its upper end terminating in a continuous rim contained entirely within a plane arranged at an acute angle with the longitudinal axis of the protector. A carrying handle is formed adjacent the uppermost point on the rim and is defined by a concave inverted integral recess that extends upwardly beyond said uppermost point on said rim.

ERRATUM

For Class 47—58 see:
Patent No. 3,748,783

3,748,782
TRAFFIC FLOW CONTROLLER
Donald K. Reynolds, 2146 Prairie Ave., Miami Beach, Fla.
Filed Nov. 14, 1972, Ser. No. 306,315
Int. Cl. E01f 13/00
U.S. Cl. 49—49 **14 Claims**

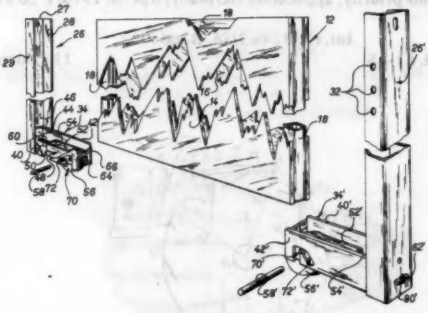


A traffic flow controller including a barrier coupled to a support for moving between a raised position and a lowered position in response to an automotive vehicle driving over the barrier. The barrier is biased to the raised position, and control means stops the barrier at an intermediate position after each alternate depression of the barrier to the lowered position. Thus, depression of the barrier to the lowered position by the front wheels of an automotive vehicle causes the barrier to rise to the intermediate position, and depression of the barrier to the lowered position by the rear wheels of the vehicle causes the barrier to rise to the fully raised position.

3,748,783
SEALED LIVE PLANT CONTAINER AND METHOD
Alfred Hienz Sokolies, 3612 Woodlawn, Gurnee, Ill.
Filed Apr. 13, 1971, Ser. No. 133,618
Int. Cl. A01g 9/02
U.S. Cl. 47—58 **12 Claims**

A live plant display assembly comprising a gas-impermeable hollow container sealed from ambient atmosphere and composed of a material transmitting light to a degree sufficient for photosynthesis having an ecologically balanced soil-animal-plant system capable of self-supporting life cycles therein.

3,748,784
SLIDING GLASS PANEL
Denis L. Smits, St. Hilaire, Quebec, Canada, assignor to Superseal Corporation, Quebec, Canada
Filed Oct. 6, 1971, Ser. No. 186,931
Int. Cl. E05d 13/02
U.S. Cl. 49—425 **3 Claims**



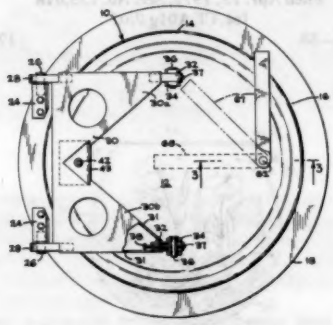
The disclosure herein describes a sliding glass panel structure which comprises a double-glazed hermetically sealed unit, a pair of vertically disposed reinforcing members secured to the two opposite sides of the unit and a pair of adjustable roller support assemblies, each mounted at the lower end of each reinforcing member. A surrounding frame is no longer required; hence, the sliding glass panel of the invention becomes a structural self-contained unit which is sufficiently rigid to maintain the mechanical stability expected of sliding glass panels.

3,748,785

TWO-WAY PRESSURE HATCH AND LATCHING MEANS THEREFOR

Fred A. Craig, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 17, 1971, Ser. No. 199,601
Int. Cl. E05b 65/06
U.S. Cl. 49—394 8 Claims



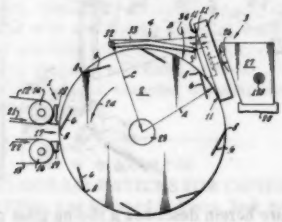
A hatch for a diving bell or the like which is able to withstand both internal and external pressures is comprised of a curved body portion having an annular lip adapted to seal against the flat upper surface of the coaming which forms the hatchway. The hatch is latched by means of an expandable split ring which is adapted to be received in its expanded condition under an annular lip on the coaming. The ring is expanded by means of a toggle joint connection at the adjacent opposed ends of the ring which toggle joint is arranged to be pivoted into a locked overcenter position by a rotatable pin that may be rotated by handles located at both sides of the hatch.

3,748,786

APPARATUS FOR SHARPENING ROTARY CUTTERS FOR TOBACCO OR THE LIKE

Uwe Elsner, and Werner Komossa, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Mar. 26, 1971, Ser. No. 128,475
Claims priority, application Germany, Apr. 8, 1970, P 20 16 649.8
Int. Cl. B24b 3/36; B26d 7/12
U.S. Cl. 51—5 11 Claims



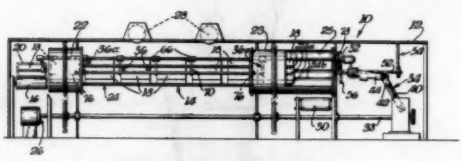
The cutting edges of knives which are mounted on a rotary holder of a tobacco shredding machine are sharpened by the front surface or surfaces of one or more crown grinding wheels mounted on one or more carriages which are reciprocable in parallelism with the axis of the holder and dwell for selected intervals of time at the respective axial ends of the holder. The front surface of each grinding wheel is reconditioned by a discrete diamond which is pivotable about a fixed axis at the respective axial end of the holder. Each grinding wheel is fed axially toward the holder to compensate for wear and to maintain the respective front surface at a fixed distance from the axis of the holder. Each diamond can be set in motion in automatic response to completion of movement of the respective carriage toward the respective axial end of the holder.

3,748,787

WORKPIECE TREATING APPARATUS

James Hugh Carpenter, Hagerstown, Md., and Harper Willard Good, Waynesboro, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 65,465, Aug. 20, 1970, abandoned.
This application May 15, 1972, Ser. No. 253,381
Int. Cl. B24c 9/00
U.S. Cl. 51—15 14 Claims



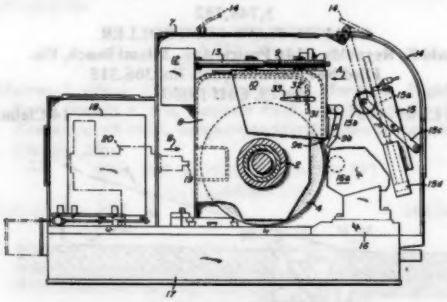
A workpiece treating apparatus includes a slatted barrel for holding the workpieces during rotation of the barrel. A draw bar is disposed generally parallel to the barrel slats and has workpiece engaging pawls thereon. The draw bar is mounted for oscillatory movement and for rotational movement about its own axis so that the pawls can engage the workpieces and pull them forward in the barrel and can then be disengaged from the workpieces whereby the pawls may return to their original position.

3,748,788

CONTROL DEVICE FOR A GRINDING MACHINE

Georg Koppenwallner, Weil der Stadt, Germany, assignor to Fortuna-Werke Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Filed Sept. 1, 1971, Ser. No. 176,993
Claims priority, application Germany, Sept. 5, 1970, P 20 44 147.8
Int. Cl. B24b 49/00, 55/02
U.S. Cl. 51—165.87 15 Claims

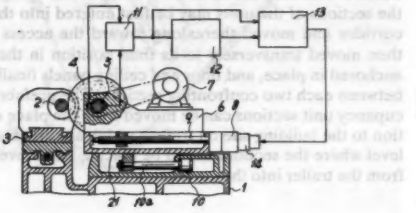


A grinding machine having a grinding disc with a hood. A dressing device is associated with the disc and the hood has a moveable part with a coolant nozzle thereon which supplies coolant to the working region of the disc. Drives are provided to move the dressing device toward and away from the wheel and to adjust the position of the part of the hood and the coolant nozzle and are so interconnected that the coolant nozzle is adjusted in position each time the dressing device dresses the disc whereby the coolant is always directed to the proper region.

3,748,789
GRINDING MACHINE

Ryuji Wada, and Kimio Kanou, both of Aichi, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Aug. 26, 1971, Ser. No. 175,073
Claims priority, application Japan, Aug. 28, 1970, 45/74935
Int. Cl. B24b 49/16
U.S. Cl. 51—165.8 6 Claims

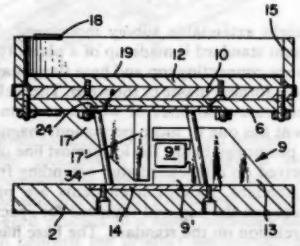


A grinding machine capable of changing an infeed speed of a wheel slide during a grinding operation. When the grinding resistance is exceeded beyond a predetermined value, while the wheel slide is advanced toward a workpiece at a speed which is dominated by a selected predetermined optimum value for the grinding condition, the infeed speed thereof is changed from the selected predetermined optimum value to another optimum value or values for a predetermined period. As long as the grinding resistance is kept within the predetermined value, the infeed speed of the wheel slide is changed as a function of the grinding resistance and the selected predetermined optimum value.

3,748,790
LAPPING MACHINE AND VIBRATORY DRIVE SYSTEM THEREFOR

Frank A. Pizzarello, 13811 Dall Ln., Santa Ana, and Daniel Medellin, 7500 Western Ave., Buena Park, both of Calif.

Filed Aug. 16, 1971, Ser. No. 172,103
Int. Cl. B24b 7/00, 9/00
U.S. Cl. 51—58 6 Claims



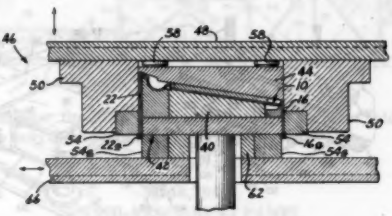
Disclosed is a unitary spring assembly for a lapping machine whereby a lapping plate may be reciprocally vibrated at mechanical resonance at varying loads. Drive or vibration is provided by peripherally mounted electromagnetic solenoids whose force is applied tangential to the direction of rotation (or in the direction of displacement of the lapping plate).

This invention relates to the art of lapping and polishing articles by abrasion so as to provide such articles with one or more surfaces having a high finish, free of blemishes such as scratches or the like as might result from cutting or sawing. More particularly, the invention relates to a mechanically resonant vibratory drive system capable of producing a continuous lapping and polishing action or motion between a surface of an article and an abrasive or polishing member.

3,748,791
METHOD OF MAKING FINISHED METAL DIE CASTINGS

Edwin T. Foster, South Haven, Mich., assignor to Du-Wel Metal Products, Inc., Bangor, Mich.

Filed Oct. 14, 1971, Ser. No. 189,184
Int. Cl. B24b 1/00
U.S. Cl. 51—323 5 Claims

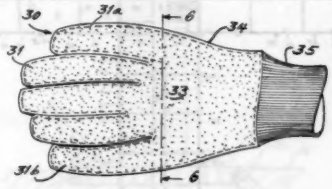


A method of making a finished metal die casting, especially one formed of aluminum or zinc, or alloys thereof, and having one or more wall portions, the outer surfaces of which are to be buffed prior to plating. The method involves taking a die casting, from which unwanted metal, in the form of flashing remaining on the edges of the walls of the casting after it has been removed from the mold, or in the form of a bead remaining at the edges of the walls of the casting after the flashing has been removed in accordance with standard practices, and rigidly positioning the die casting with support means with the outer surfaces of the walls of the casting facing outwardly and the unwanted metal bearing edges of the walls extending to a point where they are free of contact with the support means. With the casting so positioned, a metal shearing or cutting tool is moved outwardly from the inner side of the walls of the casting to sever the walls at a point inwardly of the edges thereof to form new edges on the walls having metal burrs therealong adjacent to the outer surface of the walls. The casting is then removed from the support means, and the outer surfaces of the walls are buffed to simultaneously impart a finished appearance to the casting and to remove the burrs from the newly formed edges. Other operations, such as piercing holes in the casting, can be performed at the same time as the walls are being sheared or trimmed.

3,748,792
SANDING GLOVE

Walter M. Lamb, 2335 S. Kingshighway, St. Louis, Mo.

Filed Mar. 3, 1970, Ser. No. 16,036
Int. Cl. B24d 15/00; A41d 19/00
U.S. Cl. 51—391 1 Claim



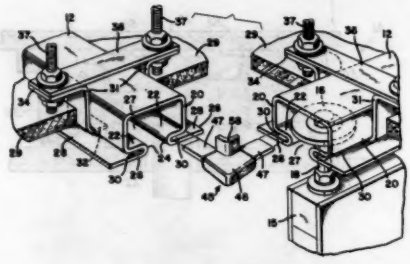
A sanding glove having a cloth hand covering and sandpaper fastened to one or both of the outer surfaces thereof and retained on the hand of the user by a stretchable cuff which fits around the user's wrist. The glove can be a mitt or finger glove or a finger glove with similar thumb and little finger pockets so that the glove is usable on either hand. The mitt has sandpaper on both sides so that it can be used on either hand.

3,748,793

INTERSECTION CONSTRUCTION FOR MOVABLE WALL PANEL SYSTEM

Melvin W. Tompkins, and George F. Retz, both of New Castle, Ind., assignors to American Standard Inc., New York, N.Y.

Filed May 11, 1971, Ser. No. 142,158
Int. Cl. E04b 2/78
U.S. Cl. 52—64 3 Claims



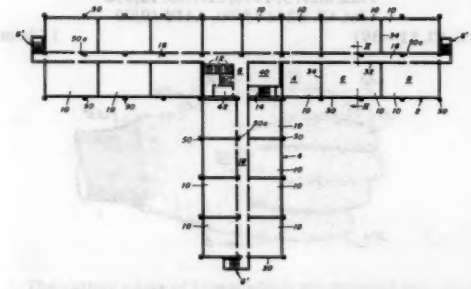
Overhead tracks for movable wall panels are particularly adapted to receive one or more intersection-forming inserts which facilitate fabrication of a plurality of tracks into grid form. Each intersection-forming insert includes a central corner-forming body and interlock arms extending outwardly from the body, usually at right angles to each other. Each arm is engaged in a cooperating gap, preferably formed on the adjacent tracks, and the body has an upper surface and a pair of generally vertical side surfaces which form extensions of the track. The side surfaces converge together to form an intersection corner, and in one embodiment define a 90° arc and in another embodiment define an arc between 45°–90°. Abutment surfaces are formed on the body for positioning the body in a corner-forming position, and a vertical stem-like portion of the body mates against the side walls of adjacent tracks.

3,748,794

BUILDING CONSTRUCTION AND METHOD

Silvio J. Lorenzi, Pittsburgh, Pa.; Robert M. Dodds, Washington, D.C., and Edward F. Gunnill, Pittsburgh, Pa., assignors to Lorenzi, Dodds and Gunnill

Continuation-in-part of Ser. No. 767,896, Sept. 12, 1968, abandoned. This application Nov. 20, 1970, Ser. No. 91,349
Int. Cl. E04h 1/12, 9/06
U.S. Cl. 52—79 8 Claims



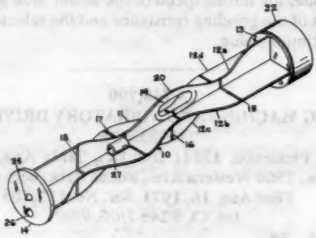
There is disclosed a building having a multi-story structural frame that is erected on the building site, but has a plurality of prefabricated occupancy units in at least most of the floors thereof. To this end the structure has one or more elongated wings terminating at one end in an access section in which elevator and stairs may be located, and on each floor in this section service facilities, laundry facilities, etc., are positioned. Each such floor of the elongated frame provides two parallel corridors into which occupancy units are inserted in end-to-end relation from the end remote from the access area, and there is space defining a hallway between the corridors. The exterior curtain walls of the occupancy units comprise exterior walls of the finished building and curtain walls of the occupancy units confronting the hallway provide inside walls of the hallway. Each occupancy unit preferably comprises two longitudinally confronting sections, the combined width of which is less than the combined width of the corridor so that the sections of the units may be first entered into the end of a corridor and moved therealong toward the access area, and then moved transversely to its final position in the corridor, anchored in place, and floor and ceiling panels finally inserted between each two confronting sections. The prefabricated occupancy unit sections can be moved from the place of fabrication to the building site on trailers which are lifted to the floor level where the sections are to be placed, and moved endwise from the trailer into the corridor.

3,748,795

SURVEY MONUMENTS OF FRANGIBLE SECTIONS

Peter Berntsen, Madison, Wis., assignor to Berntsen Cast Products, Inc., Madison, Wis.

Filed Feb. 24, 1972, Ser. No. 229,129
Int. Cl. G01c 15/04
U.S. Cl. 52—98 2 Claims



A light-weigit extendable survey monument. The metal-alloy monument standard is made up of a plurality of integral undulating webs connecting top and base flanges and having a carrying handle formed in one of the webs. The webs have vertically spaced transverse lines of weakness formed therein. The monument has one or more permanent magnets, at least one which is positioned below the lowermost line of weakness. A cap is received on a threaded stud extending from the top end of the standard. Extension elements are provided for placement between the cap and standard for spacing the cap in extended relation on the standard. The base has a depending centering point.

3,748,796

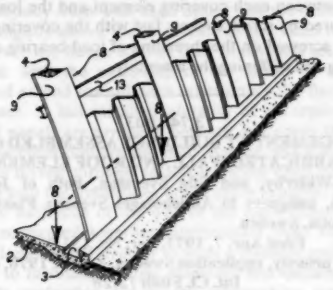
BUILDING STRUCTURE WITH COMPOSITE ARCHED UNITS AND METHOD OF CONSTRUCTION THEREOF

Paul Ouellet, 8705 Nevers St., Montreal 457, Quebec, Canada

Filed Nov. 16, 1971, Ser. No. 199,268
Int. Cl. E04b 1/32
U.S. Cl. 52—86 3 Claims

A method of constructing a composite arch beam of concrete in situ to strengthen either an existing building structure or one under construction and a building structure including at least one composite arched unit arranged to strengthen the same. In a building structure including a plurality of elongated structural arched units arranged side by side in contiguous relationship, at least one composite arched

units amongt the other arched units, each composite arched unit including an elongated reinforcing beam structure having



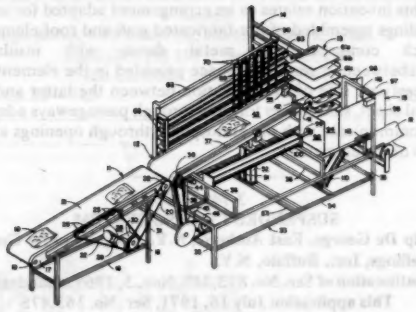
a transverse cross section forming a closed plane figure defined by trussing or by a concrete beam formed into an enclosed arch shape space.

3,748,797

ACCUMULATOR AND BOXER FOR FLEXIBLE BAGS

Donald E. Deines, Kennewick, Wash., assignor to Deines-Baker Development Co., Kennewick, Wash.

Filed Mar. 20, 1972, Ser. No. 235,975
Int. Cl. B65b *35/50*
U.S. Cl. 53—124 D **5 Claims**



A mechanism to accept containerized product, particularly frozen potato products in flexible bags, in an unordered fashion, accumulate the product in vertical array and positively deposit the amassed array in a container. A slower conveyor presents bagged product to a faster pivotably mounted conveyor which deposits the product successively on vertically spaced accumulator plates that are moved toward each other to compact the array of product between adjacent plates; the compacted product is then moved horizontally into a pre-positioned container which is removed for closure and further processing.

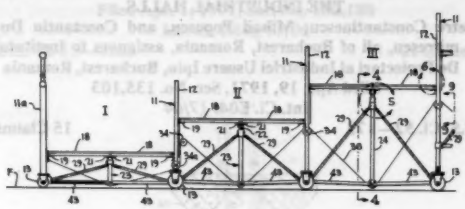
3,748,798

FOLDABLE GRANDSTAND

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif.

Filed May 11, 1972, Ser. No. 252,260
Int. Cl. E04h *3/14*
U.S. Cl. 52—10 **6 Claims**

A grandstand arrangement capable of being completely folded by means of a powered winch mechanism and cable entrained about pulleys staggered between the front and rear ends of the grandstand to effect an upward lift at each level and a complete folding of the arrangement. Spacers are also



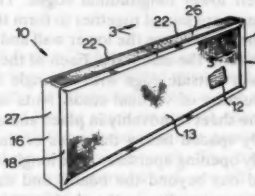
provided near the floor level to maintain a uniform folding between tiers thereby increasing its stability.

3,748,799

SOUND-ABSORBENT PANEL

William J. Tough, and Roy A. Hintsa, both of Etobicoke, Ontario, Canada, assignors to A. E. Rule (1965) Limited, Rexdale, Ontario, Canada

Filed May 13, 1971, Ser. No. 143,124
Int. Cl. E04c *2/38*; E04b *1/82*
U.S. Cl. 52—144 **8 Claims**



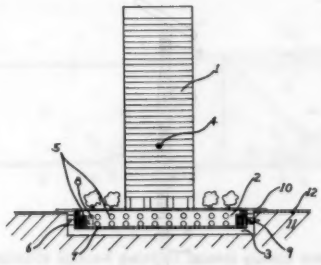
A partition unit is disclosed which includes a rigid panel and an enclosing, channel-shaped, one-piece edge member. The two ends of the edge member abut one another mid-way of a rectilinear edge of the panel, and double-faced adhesive tape is applied along that edge, spanning the end abutment and affixing the partition unit to a flat surface.

3,748,800

EARTHQUAKE-INSULATION FOUNDATIONS

Raymond Charles Glicksberg, 1725 Ocean Front, No. 610, Santa Monica, Calif.

Filed Apr. 22, 1971, Ser. No. 136,514
Int. Cl. E04h *9/02*; E02d *27/34*
U.S. Cl. 52—167 **7 Claims**



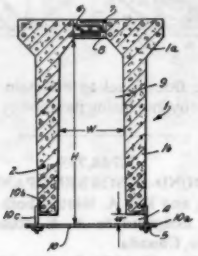
The present invention relates to earthquake-insulation foundation construction consisting of floating a spring-centered building-base upon a water-filled excavation which has been lined with a spring-tensioned cable network covered with an expansible, pleated, water-tight sheet. Alternative means consist of resting a flat-bottomed building-base upon an excavation filled with a dry granular particulate such as sand.

3,748,801

PREFABRICATED GIRDER CHANNEL FOR VENTILATION HEATING OR AIR CONDITIONING OF THE INDUSTRIAL HALLS

Petre Constantinescu; Mihail Popescu, and Constantin Dumitrescu, all of Bucharest, Romania, assignors to Institutul De Proiectari al Industriei Usoare Ipiu, Bucharest, Romania

Filed Apr. 19, 1971, Ser. No. 135,103
Int. Cl. E04f *17/04*
U.S. Cl. 52—173 15 Claims



An air-diffuser girder is formed by a pair of laterally adjacent reinforced-concrete main beams and a thin sheet spanning their lower longitudinal edges. The crosspieces of the main-beams are joined together to form the upper wall of a duct while the sheet forms the lower wall and the vertical webs of the beams form the side walls. Each of the beams is molded along its lower outside edge with an angle iron to which are welded a plurality of vertical studs. Nuts mounted on these studs hold the sheet removably in place and allow this sheet to be adjustably spaced below the soles of the beams so as to form laterally opening apertures. The longitudinal edges of the sheet extend out beyond the beams and can be bent up to direct air flow upwardly, or the sheet can be shaped against the soles of the beams and formed with central downwardly opening nozzles.

3,748,802

BUILT-UP RAIL POST BY WHICH THE STEPS OF SPIRAL STAIRS ARE CONNECTED WITH THE HAND RAIL, AND COMPONENTS OF SUCH RAIL POST

Giuseppe Verderio, Via San Rocco, Cernusco sul Naviglio (Milan), Italy

Filed Mar. 10, 1971, Ser. No. 122,745
Claims priority, application Italy, Apr. 10, 1970, 23153 A/70
Int. Cl. E04f *11/18*
U.S. Cl. 52—187 1 Claim

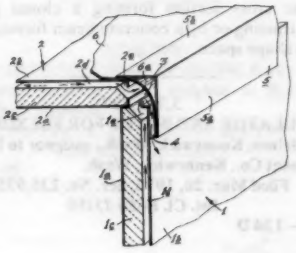
This invention concerns a built-up rail post, by which the steps of spiral stairs and particularly of dismountable spiral stairs, are connected with the hand rail. The invention also covers the components of same rail post, said built-up rail post consists of an allthreaded, load-bearing central rod, made preferably of a metal, and of a plurality of covering tubular elements, slipped on to said load-bearing core, being the connection between each covering element and the load-bearing core ensured by screw sockets fast with the covering element ends and screwed on the threading of load-bearing core, thus stabilizing and stiffening the assembly.

3,748,803

ARRANGEMENT AT BUILDINGS ASSEMBLED OF PREFABRICATED WALL AND ROOF ELEMENT

Lennart Widerby, and Stig Svensson, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Apr. 7, 1971, Ser. No. 131,908
Claims priority, application Sweden, Apr. 9, 1970, 4883/70
Int. Cl. F04h *12/28*
U.S. Cl. 52—303 2 Claims



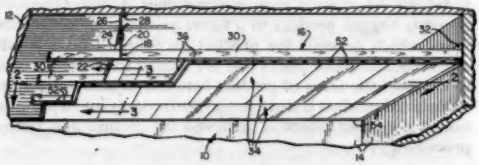
This invention relates to an arrangement adapted for use at buildings assembled of pre-fabricated wall and roof elements, which comprise two metal sheets with insulation therebetween, a ventilated space provided in the elements on at least one side of the insulation between the latter and the metal sheet, said spaces forming through passageways adapted to communicate with the atmosphere through openings at the ends of the elements.

3,748,804

SUSPENDED CEILING SYSTEM

Philip De George, East Amherst, N.Y., assignor to De George Ceilings, Inc., Buffalo, N.Y.

Continuation of Ser. No. 873,249, Nov. 3, 1969, abandoned.
This application July 16, 1971, Ser. No. 163,475
Int. Cl. E04b *5/57*
U.S. Cl. 52—484 1 Claim



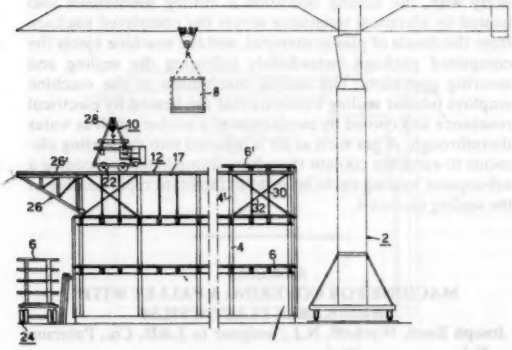
A suspended ceiling system adapted to cover the interior overhead ceiling and wall structure in a building and a method of installing the same include at least one first installed main longitudinal metal runner of inverted T-shaped cross section including an upper web suspended from the overhead structure at a selected level therebelow and a lower transverse flange projecting laterally from each side of the web. A next installed plurality of auxiliary wooden cross runners of rectangular cross section are arranged in parallel spaced relationship

along both sides of the main runner with their inner ends supported by the flange in substantially abutting relationsip with each side of the web and their outer ends supported by either the flange of another main runner or an angle bar anchored to the adjacent wall so that the undersides of the cross runners are substantially flush with each other, and are either spaced or offset slightly above the underside of the main runner, or notched over the flange so that their undersides are substantially flush with the underside of the latter, or slotted to receive and extend toward each other under the flange of the main runner. A last installed plurality of decorative and/or acoustical panels are arranged beneath and cover the undersides of the cross runners and main runner, and a plurality of staples are driven through selected mating edge portions of the panels into the undersides of the cross runners. The cross runners on each side of the web of the main runner may be pivotally connected together intermediate their ends to an overlying longitudinal stringer to form a foldable and unfoldable group to facilitate storage, shipment and installation, and the panels preferably are of the interlocking tongue and groove type, wherein the staples piercing a female mating edge portion of one panel are covered by the later installed and interlocked male mating edge portion of an adjacent panel.

ERRATA

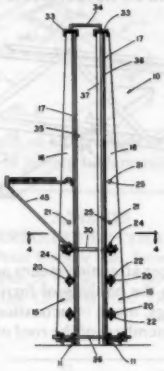
For Classes 52—745 and 52—426 see:
Patents Nos. 3,748,814 and 3,748,815

3,748,805
BUILDING STRUCTURE AND METHOD OF ERECTING SAME
Yedidya Boros, 75 Pinsker St., Rishon Le Zion, Israel
Filed Oct. 18, 1971, Ser. No. 189,872
Int. Cl. E04g *21/14*; E04b *1/343*
U.S. Cl. 52—745 **5 Claims**



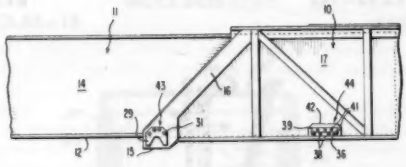
A building structure comprises vertical columns, prefabricated floor slabs supported by the vertical columns and horizontal steel beams supported on the upper ends of the vertical columns. Each horizontal beam includes a bottom flange and an upwardly extending vertical leg, the bottom flanges being fixed to the vertical columns, and the ends of the prefabricated floor slabs being supported on the upper faces of the flanges and being fixed by concrete to them and to the vertical legs of the beams. The beams thus provide temporary support during the erection of the building and permanent reinforcement for the finished building structure, and in addition, when erecting the building, their vertical legs serve as tracks for a small portable crane which is used to convey the floor slabs, thus speeding-up the laying of the floor and decreasing the crane hoisting-time.

3,748,806
CONCRETE WALL FORM
Vytautas P. Talandis, 23305 Haweswood Dr., Crete, Ill.
Filed Apr. 1, 1971, Ser. No. 130,180
Int. Cl. E04g *11/06*
U.S. Cl. 52—426 **21 Claims**



A concrete wall form of light weight construction includes a framework which is quickly assembled to support mold panels placed in rectangular or other configuration, one of the panels being disposable and having a pattern surfact, the other panels becoming integral with the poured concrete providing an insulating barrier and an innerfinished wall. The framework includes strong light weight parts which are all quickly and removably interconnected.

3,748,807
ADJUSTABLE AND REPLACEABLE LATERAL GUIDES FOR TELESCOPIC CRANE BOOM
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Oct. 12, 1971, Ser. No. 187,969
Int. Cl. B66f *9/08*; F16c *23/04*
U.S. Cl. 52—632 **9 Claims**



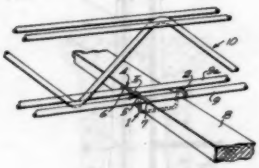
Longitudinally spaced pairs of lateral guides are mounted on the relatively fixed section of a telescopic crane boom adjacent to the solid bottom chord of the movable section of the boom. The laternal guides are constrained against movement with the movable boom section by key or holder elements and the guides are adjustable laterally to establish an initial running clearance and are subsequently adjustable to compensate for wear. The guides are easily replaceable when necessary.

3,748,808

WIRE FURRING HANGERS

Gordon M. Sheppard, deceased, late of 1644 Washington St., Hollywood, Fla.; Dame Lillian Brodeur, Jack Sheppard, and Philip Brodeur, all of 4485 Industrial Blvd., Hollywood, Fla. (Executors and Trustees)

Filed June 25, 1970, Ser. No. 49,755
Int. Cl. E04c 2/42, 5/04
U.S. Cl. 52—665 3 Claims



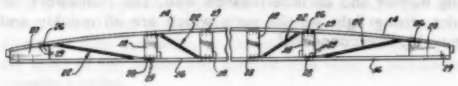
A wire furring hanger attaching means adapted to save time, material and labor in the hanging of furring strips to support plaster or false ceilings, made of acoustical or other material, from the supporting members of the roof of a building.

3,748,809

TRUSSED JOIST STRUCTURE

Edgar D. Jackson, Claremont, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed Aug. 9, 1971, Ser. No. 169,998
Int. Cl. E04c 3/42
U.S. Cl. 52—644 1 Claim



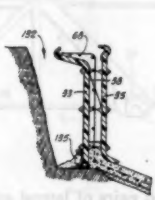
A special structure particularly applicable for a mobile home roof support including a joist frame braced with steel web members having flat connecting ends and an angled body portion.

3,748,810

METHOD OF SWIMMING POOL MANUFACTURE

Charles D. Mattingly, Wichita, Kans., assignor to Mattingly, Inc., Wichita, Kans.

Division of Ser. No. 792,047, Jan. 17, 1969. This application Mar. 24, 1971, Ser. No. 127,709
Int. Cl. E04h 3/16
U.S. Cl. 52—742 8 Claims



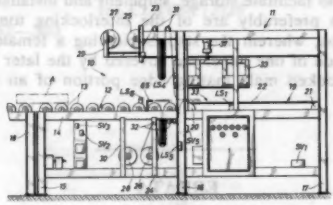
This invention relates to the structural elements required and the method of constructing a swimming pool having the ultimate in design, space efficiency, ease of maintenance, and durability. More particularly, this invention relates to a means of constructing a swimming pool through the use of a plurality of interconnected inside, outside, and step form structures placed in cooperating positions with the plumbing, electrical, and reinforcing steel placed therebetween whereupon an entire concrete swimming pool can be poured in substantially one operation. Still, more specifically, this invention is a method of constructing a swimming pool utilizing cooperating form structures whereupon a pool can be built in a minimum amount of time without skilled labor, in a variety of design variations, and using a plurality of pre-constructed engineered elements achieving a maximum of uniform and durability therefrom.

3,748,811

PACKAGING METHOD AND MACHINE

Thomas L. Cox, Beaumont, Tex., assignor to J&J Manufacturing Company, Beaumont, Tex.

Filed Nov. 4, 1971, Ser. No. 195,589
Int. Cl. B65b 9/02, 51/08
U.S. Cl. 53—28 13 Claims



A packaging machine for producing a loosely wrapped package containing a manufactured article, such as a bale of tacky polymer. The product is positioned by the machine between sheets of thermoplastic material that are heat-sealed in spaced relation about the periphery of the product to form a loose envelope about the article. The packaging machine employs a heat-sealing mechanism heated by electrical resistance to seal the downstream end the upstream end of a package and to seal the downstream end of an immediately following package in a single operation. Subsequent to, or simultaneously with, the sealing operation a cutting mechanism also heated by electrical resistance severs the completed package from the sheets of plastic material, and the machine ejects the completed package immediately following the sealing and severing operation. The sealing mechanism of the machine employs tubular sealing elements that are heated by electrical resistance and cooled by circulation of a coolant such as water therethrough. A gas such as air is injected into the sealing elements to eject the coolant therefrom immediately preceding a subsequent heating cycle in order to facilitate rapid heating of the sealing elements.

3,748,812

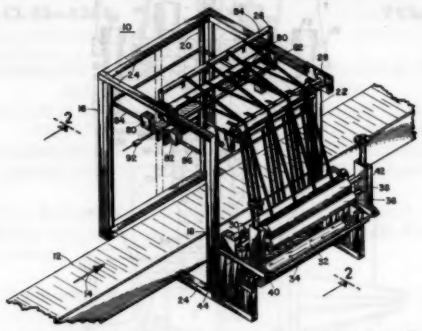
MACHINE FOR COVERING A PALLET WITH SHRINKABLE PLASTIC FILM

Joseph Burn, Wyckoff, N.J., assignor to J.&H. Co., Paterson, N.J.

Filed Oct. 26, 1971, Ser. No. 192,365
Int. Cl. B65b 57/12, 43/26
U.S. Cl. 53—66 3 Claims

A loaded pallet is carried on a conveyor belt under a support frame. The support frame has motor driven rollers to which are fed double layer plastic bags open at one end. The rollers engage the end of the bag and draw it down until it is engaged by suction heads and mechanical clamps on opposite sides of the bag. The suction heads move down and pull out the sides of the bag to enclose the loaded pallet. As the open bag is moving downwardly, a sensor moving with the suction heads measures the height of the incoming or next pallet. When the suction heads reach the bottom of their travel, they will have measured the height of the incoming pallet. As the sensor moves down, a double layer plastic tube or centerfold is

being fed forward from a supply roll. When the suction reaches the bottom position, the tube is cut and sealed to form

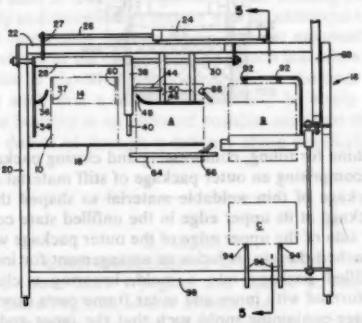


a new bag. The new bag is carried by spaced tensioned belts to a position above the motor driven rollers so that the next pallet can be covered.

ERRATUM

For Class 53—124 see:
Patent No. 3,748,797

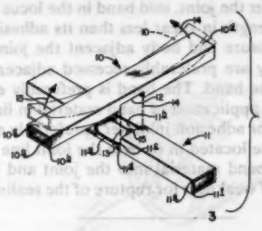
3,748,813
SHIPPING CARTON CLOSURE MACHINE
Herbert J. Sabel, 7074 Sayre Dr., Oakland, Calif.
Filed Apr. 3, 1972, Ser. No. 240,429
Int. Cl. B65b 7/20
U.S. Cl. 53—374 **11 Claims**



A machine is disclosed for automatically folding the top and bottom flaps of a shipping carton at the same time a change in elevation is achieved with the carton kept level at all times.

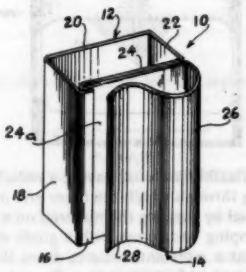
3,748,814
DECORATIVE METAL GRID SYSTEM FOR WINDOWS
James T. Cribben, Mechanicsburg, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Sept. 16, 1971, Ser. No. 180,971
Int. Cl. E04c 2/42
U.S. Cl. 52—668 **7 Claims**

A decorative metal grid system for windows comprising two cross pieces of hollow rectangular tubular metal members interlocked together to form a rectangular or parallelogram pat-



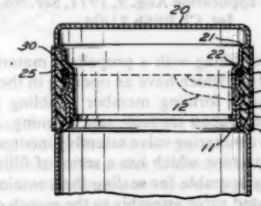
terned grid to be used on either single or insulated glazed windows and a method of joining such members together.

3,748,815
PLASTERBOARD TO COLUMN CLIP
Alvin S. Parker, 2 Peter Cooper Rd., New York, N.Y.
Filed Jan. 3, 1972, Ser. No. 214,733
Int. Cl. E04c 3/30, 5/00
U.S. Cl. 52—714 **2 Claims**



A clip for aiding the attachment of plasterboard to structural columns and the like comprising a box section having a spring flap formed integrally therewith. The spring flap slips onto a flange of the column and the box section provides attaching surfaces for sheet metal screws. When several clips are used the column may be encapsulated and therefore fireproofed by the plasterboard.

3,748,816
METHOD OF SEALING A CONTAINER
Richard W. Asmus, 3628 W. 48th St., Cleveland, Ohio
Division of Ser. No. 863,105, Oct. 2, 1969, Pat. No. 3,608,772.
This application Jan. 25, 1971, Ser. No. 109,560
Int. Cl. B65b 61/00
U.S. Cl. 53—15 **6 Claims**



A reclosable container having a removable top closure mechanically joined to the container body to carry the structural loads of container and contents, the mechanical joint being cylindrical and connected and disconnected by rotation

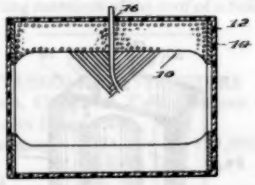
of the top closure and the container body relative to each other. The ultimate seal during the shelf-life between filling and initial opening of the container is effected by a rupturable band adhered over the joint, said band in the locus of the joint line having a strength in shear less than its adhesive bond to the container closure and body adjacent the joint line. The closure and body are preferably recessed adjacent the joint line to receive the band. The band is preferably endless and formed in situ by application of band material in liquid condition; a repellent or adhesion inhibiter (preferably an immiscible liquid) may be located in or over the joint line to exclude entrance of the band material into the joint and provide an equatorial area of weakness for rupture of the sealing band.

3,748,817

METHOD OF PRODUCING A PACKAGE OF FLEXIBLE MATERIAL WITH RADIAL INNER END FEED OUT

James W. Newman, Scarsdale, N.Y., assignor to Windings, Inc., Yonkers, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,767
Int. Cl. B65d *63/04*
U.S. Cl. 53—21 FW **1 Claim**



A package of flexible material having a radial opening into the axial opening through which the inner end of the material is led out is formed by winding the material on a mandrel having outwardly sloping end forms with a guide moving with a constant stroke at a constant distance from the axis of the spindle and the stroke of which is coordinated with the rotation of the spindle. The resulting package has outwardly sloping end walls. After the package is completed, it is compressed endwise until the end walls are substantially perpendicular to the longitudinal axis of the package.

ERRATUM

For Class 53—59 see:
Patent No. 3,749,998

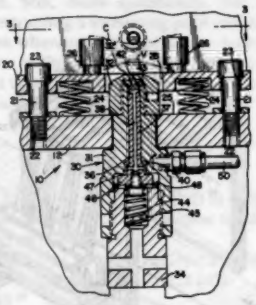
3,748,818

CONTAINER FILLING APPARATUS

Roy S. Rousseau, Bettendorf, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Continuation-in-part of Ser. No. 867,627, Oct. 20, 1969, which is a continuation-in-part of Ser. No. 811,976, April 1, 1969, abandoned. This application Aug. 9, 1971, Ser. No. 170,082
Int. Cl. B65b *31/04*
U.S. Cl. 53—88 **3 Claims**

An apparatus for filling with a propellant material aerosol containers of the type which have an opening in the container bottom with a valve forming member enabling propellant material to be introduced through said opening, which apparatus comprises a metering valve assembly incorporated in a container filling machine which has a series of filling stations each with a means operable for sealing the container closure cap and its associated valve assembly to the mouth of the container so as to close the same, and a combination container support and stripper platform at each station which is resiliently mounted above the metering valve so that downward pressure on the container resulting upon operation of the cap sealing means lowers the platform and effects a connection between the bottom fill valve or the bottom of the container and the metering valve so as to permit entry of the



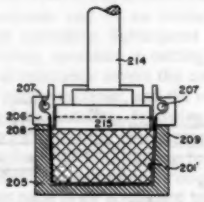
propellant through the bottom opening while the closure cap is being sealed on the container mouth.

3,748,819

ARRANGEMENT FOR FILLING AND CLOSING PACKAGES, COMPRISING AN OUTER PACKAGE AND AN INNER PACKAGE LOOSELY APPLIED THEREIN

Od W. Christensson, Bromma near Stockholm, Sweden, assignor to Christenssons Maskimer & Patenter Aktiebolag, Stockholm, Sweden

Filed Sept. 13, 1971, Ser. No. 179,698
Claims priority, application Sweden, Nov. 23, 1970, 15814/70
Int. Cl. B65b *1/24*
U.S. Cl. 53—124 B **6 Claims**



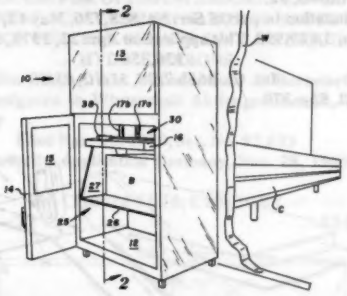
A machine for filling, compressing and closing packages of the type comprising an outer package of stiff material and an inner package of thin weldable material so shaped that the inner package at its upper edge in the unfilled state contacts the inner side of the upper edge of the outer package without being attached thereto includes an arrangement for inserting each unfilled package into a mold, lowering a clamping member formed with inner and outer frame parts down over the package-containing mold such that the inner and outer frame parts clamp the upper edges of the inner and outer packages, the clamping being retained during subsequent filling of the package and compression of the material within the package, the compression being effected by a piston or the like. The clamping frame is thereafter withdrawn, followed by further treatment of the package, such as evacuation, final closing, etc., after which the package is separated from the supporting mold. The clamping frame preferably comprises an outer frame which fits down around the upper edge of the composite package, and inner side parts which are pivotably mounted on the outer frame to pass downwardly into the package. A pressure frame pivots the side parts about their axes to complete the clamping of the upper edges of the package during filling, compression, etc.

3,748,820

TRASH COMPACTOR WITH LIFTER

Anthony Fox, 8306 Queen Ave. South, Bloomington, Minn.

Filed Apr. 19, 1972, Ser. No. 245,363
Int. Cl. B65b *1/24*
U.S. Cl. 53—124 B **7 Claims**



This invention relates to a trash compacting device having a compacting plate normally moveable in a vertical position for compacting trash placed within a housing into containers or the like and having a container supporting member having a base upon which the container will normally rest which base has upwardly extending arms, normally extending over the height of the box or container with retractable and extendable arm members arranged on the upper most surface of the compacting plate for engagement with these extending arms such that after the container has been filled, extension of the arms will lock the container supporting member to the compacting plate such that it may be elevated and which invention also includes a door in a selected portion of the housing moveable upwardly and downwardly therein with an additional extendable and retractable door engaging element mounted on the upper surface of the compacting plate such that when the lifting device is elevating the filled container the door will be opening such that a filled container may be easily pushed from the housing at an elevated position such that the same may be delivered through a delivery chute exteriorly of the machine.

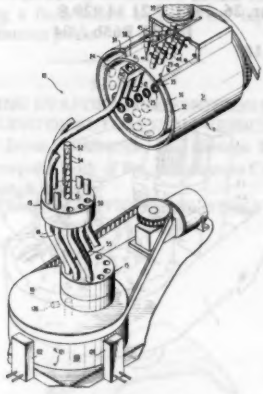
3,748,821

COIN PROCESSING APPARATUS

Gerry G. Hull, 2827 Wyngate, and Eugene B. Morris, Jr., 4520 Jolyn Pl., N.E., both of Atlanta, Ga.

Continuation of Ser. No. 48,077, June 22, 1970. This application June 15, 1972, Ser. No. 263,311
Int. Cl. B65b *35/50*
U.S. Cl. 53—159 **13 Claims**

A coin processing method and apparatus in which coins of predetermined physical characteristics are lifted from a mass of coins, dropped into a plurality of coin hoppers and moved through individual conduits down to a coin shelf. A predetermined number of coins from the hoppers are allowed to accumulate and form stacks on the coin shelf and the stacks of coins are passed in sequence over a discharge opening in the coin shelf. Balls of a diameter approximately equal to the diameter of the coins are inserted between the coin stacks at the coin shelf discharge opening, and a transparent plastic material is applied to the line of coin stacks and balls to form a continuous tubular wrapper about the coins and balls. The continuous wrapper is opened at the balls and the balls are separated from the coin stacks, leaving separate packages of coins.

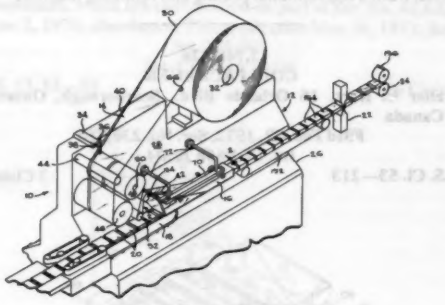


3,748,822

APPARATUS FOR PACKAGING INDIVIDUAL SLICES OF CHEESE

Henry Borgardt, Chicago, Ill., assignor to Kraftco Corporation, Chicago, Ill.

Filed Aug. 21, 1970, Ser. No. 65,814
Int. Cl. B65b *25/06*
U.S. Cl. 53—180 **2 Claims**



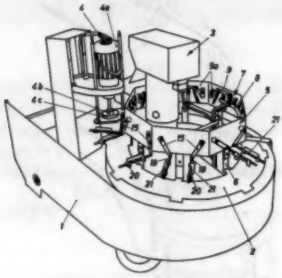
Apparatus for packaging articles such as slices of cheese or the like in individual flexible packages by advancing a flexible wrapping material and a series of articles to be wrapped into a wrapping station which causes the wrapping material to surround the articles to form a continuous tube after which the individual packages are sealed and severed. The apparatus forms a cuffed edge on one edge of the wrapping material and disposes the opposite edge of the wrapping material closely adjacent one edge of the cheese slice to effect an easy opening package which does not damage the article during opening.

3,748,823

DEVICE FOR FILLING OF CONTAINERS, PARTICULARLY BAGS, WITH LOOSE MATERIAL

Georg Mayer, Heidenheim-Mergelstetten, Germany, assignor to Mayer KG., Heidenheim-Mergelstetten, Germany

Filed Apr. 12, 1971, Ser. No. 133,324
Claims priority, application Germany, Apr. 13, 1970, P 20 17 616.3; Mar. 26, 1971, P 21 14 829.8
Int. Cl. B65b *1/04*
U.S. Cl. 53—187 23 Claims



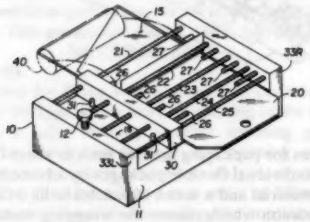
Machine for filling bags with a flowable dry material and particularly for rapidly filling successively presented bags with such material as flower soil, peat, fertilizer, plant seeds or the like. Said device utilizes a pair of spaced, substantially parallel, fingers onto which a bag may be placed, which fingers are then automatically actuated to spread same apart under a resilient force which force is sufficient to cause the fingers to stretch and distort said bag slightly and thereby hold it firmly. The bag is then filled, preferably by automatic means, after which said fingers are moved towards each other and the bag released. Said fingers may be actuated by a cam operated linkage system and may either be of relatively narrow extent or may carry pads of substantial area which conform into the internal contour of the container. Where the latter is used and the bags are not excessively distorted around said contact pads, the containers may be removed therefrom by a ram which both compacts the material within the bag and drives same off from said pads. The device as described may be driven independently if desired or may be associated with and driven from a conventional potting and repotting machine.

3,748,824

COIN PACKAGER

Walter E. Kerr, 16 Orlando Blvd., Scarborough, Ontario, Canada

Filed Feb. 29, 1972, Ser. No. 230,310
Int. Cl. B65b *11/04*
U.S. Cl. 53—213 3 Claims



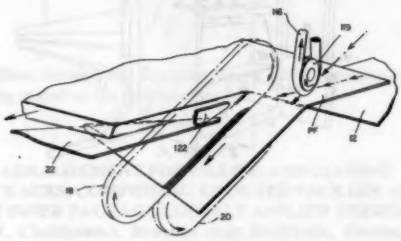
A device for the hand packaging of coins into paper covered cylinders, consisting of a sliding base surface on which the paper coin wrapper is placed, with transverse rods spaced to hold the proper quantity of coins, on edge, on the coin wrapper, and end stops to limit the proper quantity of coins. Sliding of the base rotates the coins and the coin wrapper about the coins, forming a neat cylindrical package. The end stops of the device are latched out of place to permit folding and tucking of the wrapper ends, and the removal of the coin package.

3,748,825

FILM STRAIGHTENER APPARATUS FOR WRAPPING ARTICLES IN STRETCHABLE FILM

Albert H. Chant, Jr., Holland, Pa., assignor to J. B. Dove Inc., Levittown, Pa.

Continuation-in-part of Ser. No. 823,736, May 12, 1969, Pat. No. 3,629,993. This application Apr. 22, 1971, Ser. No. 136,358
Int. Cl. B65b *7/08, 51/10, 65/00*
U.S. Cl. 53—379 6 Claims



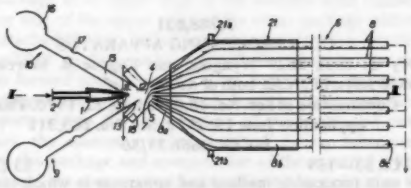
In apparatus for completing the wrapping of articles in heat-sealable stretchable film, straightening rolls pull the laterally-extending portions of the tubular wrap film laterally and forwardly to remove all wrinkles and gatherings from the film just before the laterally extending portions are gripped by gripper means and pulled diagonally downwardly in a substantially vertical plane to stretch the film tightly about the article.

3,748,826

MASS SEPARATOR

Philippe Albert Hippolyte Marchal, Boulogne; Jacques Louis Paul Simonnet, Gif-sur-Yvette; Georges Mordchelles Regnier, Neauphle-Le-Chateau, and Jean Prudent Fernand Rene Verrien, Paris, all of France, assignors to Bertin & Cie and Entreprise de Recherches et D'Activities Petrolieres-ELF, Paris, France

Filed Aug. 5, 1970, Ser. No. 61,213
Claims priority, application France, Aug. 11, 1969, 6927599
Int. Cl. B01d *57/00*
U.S. Cl. 55—17 2 Claims



A fluid mixture is separated into constituents having the same physical and/or chemical nature which were intimately mixed in the mixture, in pipes where wave phenomena occur and into which pulses of the mixture are alternately directed, a mixture enriched with the heavy constituent being collected at the inlet of the pulsating pipes and a mixture enriched with the light constituent being collected at the outlet. A conduit for supplying a continuous flow of the fluid mixture to be

separated is connected to pipes disposed in extension of the supply conduit, means being provided for converting the continuous supply flow into fluid pulses which are introduced into the pipes where they produce pulsatory phenomena; the inlet zone of these pipes is connected to a chamber for sampling the heavy constituent while their output zone is connected to a chamber for sampling the light constituent.

3,748,827

PROCESS FOR OPTIMUM ABSORPTION OF ELEMENTAL SULFUR FROM NATURAL GAS BY THE USE OF MINERAL OIL AND SIMILAR LIQUID HYDROCARBONS

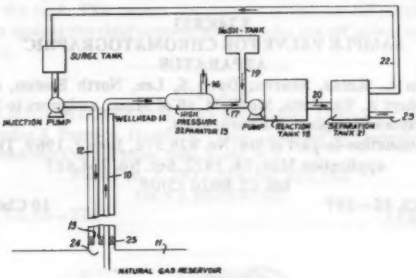
Walter Bulian, and Armin Dittmar, both of Barnstorf, Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Germany

Filed Nov. 25, 1970, Ser. No. 92,633

Claims priority, application Germany, Nov. 28, 1969, P 19 59 827.7

Int. Cl. B01d *53/16*; C10g *19/02*

U.S. Cl. 55—73 **13 Claims**



Natural gas containing elemental sulfur dissolved therein is freed of the sulfur by introducing an ascending annular current of a mineral oil into an ascending flow of natural gas. The mineral oil has a viscosity of 2-200 cP and a vapor pressure of up to 3×10^{-1} mm Hg at 20°C. The sulfur is transferred from the natural gas into the mineral oil. To insure substantially complete transference, the ratio of mineral oil in liter/hr to natural gas in Nm^3/hr should be maintained at 1: about 4-20.

3,748,828

PROCESS AND APPARATUS FOR FLUID-LIQUID CONTACTING

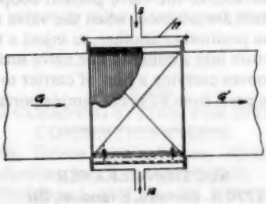
Simon Lefebvre, Mons, Belgium, assignor to Akzo Belge S. A., Bruxelles, Belgium

Filed Nov. 5, 1971, Ser. No. 195,913

Claims priority, application Belgium, Nov. 6, 1970, 758,570

Int. Cl. B03c *3/16*

U.S. Cl. 55—2 **69 Claims**



A process for fluid-liquid contacting comprising delivering at least one liquid to the end of the series of multi-filament threads arranged in at least one bundle so that the liquid flows over the threads as a liquid sheath and passing at least one additional fluid over the liquid sheath so that heat or materials are transferred between the liquid and fluid. Apparatus for trnasferring heat and materials by fluid-liquid contact comprising means for delivering and evacuating a liquid to and from a series of multi-filament threads, means for fastening these multi-filament threads so that they are in contact with the delivering and evacuating means and means for distributing and evacuating a fluid which contacts the liquid, the fluid being the continuous phase.

3,748,829

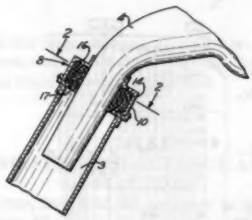
ADSORBING EVAPORATIVE EMISSION DURING FUELING OF AUTOMOTIVE VEHICLES

Ronald Stone Joyce, Pittsburgh, and George Robert Stoneburner, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed July 2, 1970, Ser. No. 51,964

Int. Cl. B01d *53/14*

U.S. Cl. 55—74 **2 Claims**



Fuel vapors which are normally lost in fueling automotive vehicles and from fuel storage tanks are adsorbed on an adsorbent, preferably activated carbon, and are subsequently recovered therefrom.

3,748,830

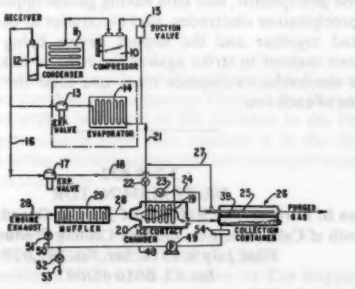
METHOD AND APPARATUS FOR PURIFYING COMBUSTION GASES

Sigmund L. Ross, Bronx, and Oscar Shuffman, Scarsdale, both of N.Y., assignors to said Oscar Shuffman by Sigmund L. Ross

Continuation-in-part of Ser. No. 131,037, April 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,622, June 2, 1970, abandoned. This application May 19, 1972, Ser. No. 255,001

Int. Cl. B01d *50/00*

U.S. Cl. 55—89 **26 Claims**



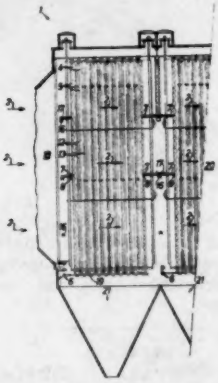
Waste combustion or exhaust gases from an internal combustion engine for motor vehicle or from other sources are directed into intimate, direct contact with the surface of ice which is supported by a subsurface and which presents an extended area of ice surface for travel of the combustion gases in contact therewith for accomplishing the deposition of particulate and other pollutants on the moist ice surface thereby provided. A moist sludge containing the pollutants is sloughed off

of the ice surface and is collected, thereby separating the pollutants from residual combustion gases. As a result of passing residual combustion gases over the surface of the collected sludge unburned carbon contained therein is produced in a form having utility as a source of activated carbon and of carbon black.

3,748,831
DEVICE FOR ELECTRIC PRECIPITATOR

Sebastian Lagerdahl, Greenwich; Kenneth Mascord, Sidney, both of Australia, and Sten Maartmann, Klinten, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed June 3, 1971, Ser. No. 149,625
Int. Cl. B03c *3/76*
U.S. Cl. 55—112 **9 Claims**



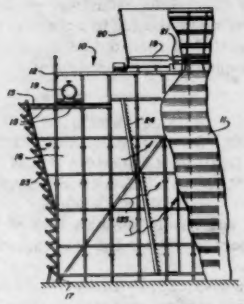
A device for electric precipitators designed for horizontal gas flow and having plane precipitation electrodes in a number of rows parallel to the direction of gas flow and with emission electrodes situated between said rows, and equipped with an impact device for cleaning at specific intervals the precipitation electrodes, the rows of precipitation electrodes being situated between a number of transverse bars at different heights of the precipitator, said bars having guides opposite each row of precipitation electrodes, said electrodes in each row being linked together and the impact device being designed in known manner to strike against the rows of linked precipitation electrodes to displace them one after the other in the plane of each row.

3,748,832
DRIFT ELIMINATOR

Donn B. Furlong, San Rafael, and John C. Ovard, Santa Rosa, both of Calif., assignors to Fluor Cooling Products Company

Filed July 9, 1971, Ser. No. 161,029
Int. Cl. B01d *45/08*
U.S. Cl. 55—257 **11 Claims**

A drift eliminator to prevent airborne water droplets which are generated in a cooling tower from escaping through the discharge outlet by trapping the water droplets in the exhaust air and redirecting the air flow through the drift eliminator. The eliminator blades, hollow in cross-section, include three plane surfaces which incorporate a series of protrusions or sharp ridges for trapping water droplets which impinge on the eliminator blades and prevent same from becoming re-entrained in the air. The blades are formed with a ballistic nose of an air foil type leading edge to reduce resistance to air movement across the drift eliminator. The drift eliminator

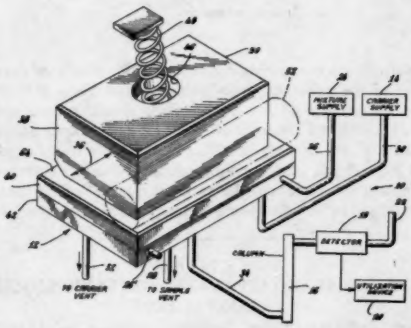


blades are assembled into unique panels to reduce field assembly time.

3,748,833
SAMPLE VALVE FOR CHROMATOGRAPHIC APPARATUS

Edwin L. Karas, Sharon; Davis S. Lee, North Easton, and Robert A. Vanslette, Medfield, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation-in-part of Ser. No. 829,576, June 2, 1969. This application Mar. 14, 1972, Ser. No. 234,617
Int. Cl. B01d *15/08*
U.S. Cl. 55—197 **10 Claims**



Chromatographic apparatus is described wherein the improvement comprises a sample valve including slidably engaged members formed of a hard, wear-resistant alumina lapped to a high degree of flatness. These valve members are adapted to be molded using relatively inexpensive techniques. The engaged surfaces of the valve present cooperating ports and cavities which are adapted, when the valve members are shifted from one position to another, to inject a fixed amount of a sample mixture into a column. The valve surfaces also are formed with grooves carrying a flow of carrier to aid in isolating the injection ports from adjacent sample ports.

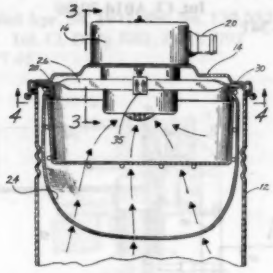
3,748,834
SUCTION CLEANER

Norman Ruby, 1770 N. Berteau, Evanston, Ill.

Filed Oct. 29, 1971, Ser. No. 193,783
Int. Cl. B01d *46/42*
U.S. Cl. 55—213 **6 Claims**

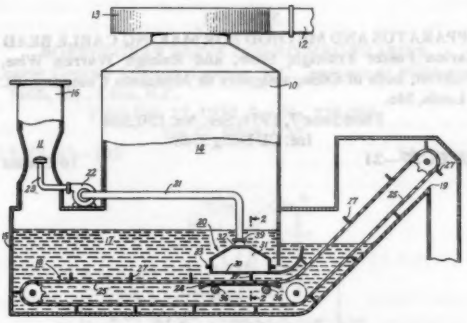
This invention is characterized by a rigid support mounted beneath the resilient lid of a suction cleaner. A motor cut off switch is mounted in the lid and this cut off switch has a

plunger positioned against the support. A suction motor is mounted in the suction cleaner and whenever the flow of air is decreased through the suction motor, as when a filter bag is clogged, or in the case of a wet pick-up suction cleaner, when the level of liquid in the tank of the suction cleaner stops the



flow of air through the suction motor, the decreased pressure inside the suction tank causes the resilient lid to flex inwardly into the tank. This causes the plunger of the cut off switch to press against the rigid support and thereby cut off power to the motor.

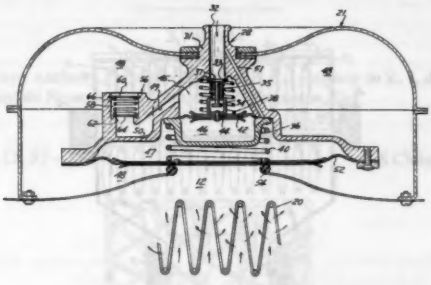
3,748,835
LIQUID FILTER FOR GAS WASHING APPARATUS
Nicholas J. Panzica, Danbury, Conn., assignor to Peabody Engineering Corporation, New York, N.Y.
Filed Feb. 7, 1972, Ser. No. 224,194
Int. Cl. B01d *47/06*
U.S. Cl. 55—228 **3 Claims**



A liquid filter for a reservoir for a liquid carrying settleable solids which are removed by a sludge conveyor having transverse vanes or blades for advancing the sludge. The filter comprises a screen forming one side of an enclosure disposed below the liquid level in the reservoir in a position such that the vanes of the return flight of the conveyor scrape along the surface of the screen to remove entrapped particles from the screen.

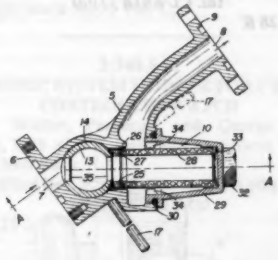
3,748,836
FILTER CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINE
Carl F. Bachle, Grosse Pointe Farms, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed June 3, 1971, Ser. No. 149,634
Int. Cl. B01d *46/04*
U.S. Cl. 55—302 **6 Claims**

An engine combustion air filter cleaning system which includes a means for storing pressurized air in a storage chamber during each high power operation of the engine. During each subsequent idling operation, there is provided an explosive release of the previously stored pressurized air to provide a reverse air flow path through the filter and to remove adherent



particles from the filter element. Provision is also made for the continuous removal of dislodged particles by a back flow of pressurized air from the engine manifold.

3,748,837
COMBINATION CUT-OUT COCK AND DIRT COLLECTORS
Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Chicago, Ill.
Filed Jan. 18, 1971, Ser. No. 107,006
Int. Cl. B01d *29/36*
U.S. Cl. 55—418 **8 Claims**

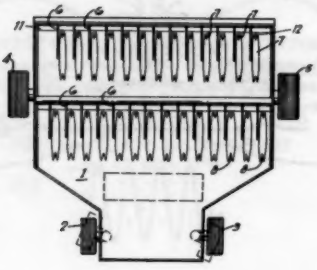


This combined cut-out cock and dirt collector for the brake pipe of railroad cars has a filter passage between the inlet and outlet passages with a ball valve at the entrance to the filter passage. A removable hollow filter element is in the filter passage and is spring pressed against the ball valve and in sealing engagement therewith.

3,748,838
NUT HARVESTING APPARATUS
Larry R. Woodfill, Tulare, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed July 7, 1972, Ser. No. 269,761
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 **5 Claims**

Each of a plurality of wheels of resilient material has a deep groove formed in and around its peripheral rim. Each of a plurality of arms is pivotally mounted on a platform and pivotally mounts a corresponding one of the wheels for rotation. A guiding device removes nuts from the grooves of the wheels and directs them to an assembly area, so that when the wheels

are rolled along the ground they pick up nuts from the ground and move them by rotating to the removal device which



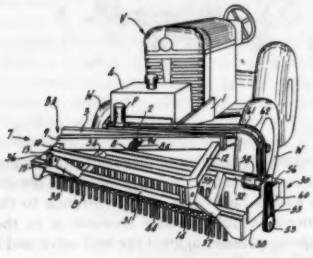
removes the nuts from the grooves and directs them to the assembly area.

3,748,839

SIDE DELIVERY BROOM

John M. Avis, Spring Lake, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Apr. 20, 1972, Ser. No. 245,985
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 R 11 Claims



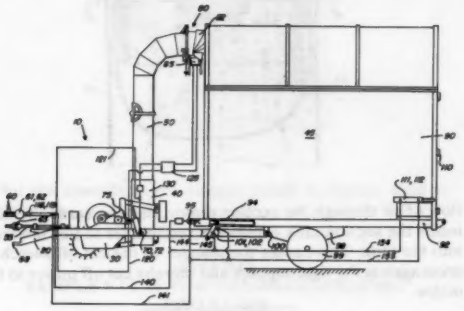
A tractor mounted, side delivery broom of the type which has an elongated, rotatably driven broom arranged ahead of the tractor and at an angle to the direction of travel so as to sweep the crop material lying on the ground to the side of the vehicle and deposit the collected crop in a swath. The side delivery rake includes an articulated frame for mounting the rotatable broom on the front of a tractive vehicle so that the broom is free to move bodily in a vertical direction as well as have its ends rise and fall in opposition to one another, thereby insuring that the rotatable broom properly follows the contour of the ground over which it traverses.

3,748,840

AUTOMATIC HYDRAULIC SYSTEM FOR A HAY WAGON

Glenn G. Kanengieter, Blooming Prairie, and Gerald F. Barry, Owatonna, both of Minn., assignors to Owatonna Manufacturing Co. Inc., Owatonna, Minn.

Filed Oct. 12, 1972, Ser. No. 297,060
Int. Cl. A01d *89/00*
U.S. Cl. 56—341 16 Claims



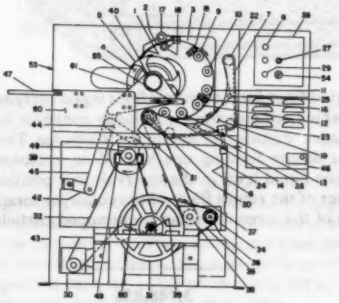
An improved hay harvester, stacker and transporter employing a simplified hydraulic system in which the components thereof will be operated in a desired sequence through the operation of a single control handle or valve.

3,748,841

APPARATUS AND METHOD FOR MAKING CABLE BEAD

Marion Foster Fraleigh, Stow, and Raleigh Warren Wise, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed June 7, 1971, Ser. No. 150,584
Int. Cl. D02g *3/48*
U.S. Cl. 57—21 10 Claims



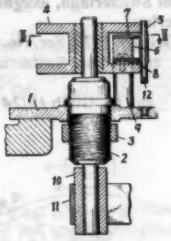
A cable bead or grommet is made by rotating an annular metal core, feeding to it substantially undistorted, metal strand and moving the supply of strand successively about the core with respect to an axis passing through its centers of cross sections while confining the path of the supply to avoid straining the strand beyond its resilience limit and synchronizing said moving of the supply with rotation of the core to apply contiguous strands.

3,748,842

APPARATUS OF DRIVING SPINNING FOR FALSE TWISTING YARN

Nobuhisa Kodaira, 2-7-10 Kamirenjaku, Mitaka-shi, Tokyo, and Norio Motegi, 1-2-8 Sakura, Setagaya-ku, Tokyo, both of Japan

Filed Apr. 30, 1971, Ser. No. 139,052
Int. Cl. D02g *1/02*; D01h *7/92*
U.S. Cl. 57—77.45 10 Claims



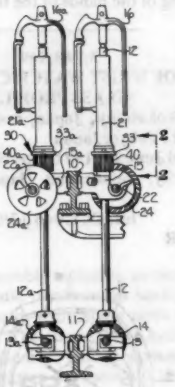
Apparatus for driving a spinner for the false twisting of yarn. The apparatus includes a drive roller consisting of a pair of discs arranged with a space therebetween, a spinner of high permeability metal which is rotated at high speed due to its rolling contact with said drive roller, and a rare earth (e.g. samarium) cobalt magnet supported on a standard which is placed in the space between the discs. The magnet has opposite pole plates and an intermediate portion of the spinner is drawn towards the magnet poles as a result of which the opposite ends of the spinner are brought into contact with the discs.

3,748,843

BOBBIN GEAR DRIVE FOR ROVING FRAMES

Lonnie Gravely Lawson, Lawson, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Feb. 22, 1972, Ser. No. 228,051
Int. Cl. D01h *1/20*
U.S. Cl. 57—102 12 Claims



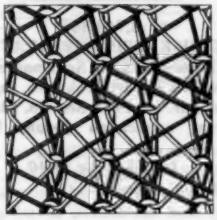
A bobbin gear drive means for a textile roving frame has a bobbin gear unit including a sleeve loosely mounted on each bolster shaft for supporting a bobbin thereon, and a tubular bobbin spur gear, made from a plastic material, such as nylon, is mounted on each sleeve so that the teeth thereof may wear away instead of the teeth of the usual spiral face gear meshing in hypoid relationship therewith. Thus, the spiral face gears rarely have to be replaced, and it is a relatively simple matter to replace the tubular bobbin gear. Also, the teeth of each bobbin gear are relatively long so that, upon a portion of the bobbin gear becoming worn excessively by engagement with a corresponding spiral face gear, the bobbin gear can be turned end-for-end on the sleeve to present a non-worn portion thereof for engagement with the corresponding spiral face gear.

3,748,844

POLYESTER YARN

Edward Anthony Pacofsky, Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 4, 1971, Ser. No. 168,953
Int. Cl. D03g *3/02*
U.S. Cl. 57—140 R 5 Claims



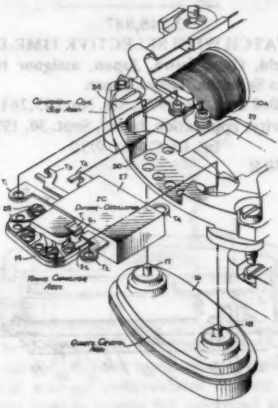
Improved multifilament polyester yarn has good processibility on knitting machines and provides good fabric bulk when used in combination with ordinary polyester yarn. The yarn is an assembly of low-shrinkage, continuous filaments of synthetic linear condensation polyester which are substantially free of crimp. The filaments are drawn and relaxed under conditions which provide a yarn having a sonic velocity value of 1.9 to 3.0 kilometers per second, an X-ray crystallinity value of 16 to 35 percent, and a single shrinkage-tension peak at a temperature below 100°C.

3,748,845

ELECTRONIC SYSTEM MODULE FOR CRYSTAL-CONTROLLED WATCH

William W. Mutter, Paramus, and George P. Gruner, Ridgewood, both of N.J., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,000
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 A 6 Claims



A replaceable module incorporating the electronic systems for a compact crystal-controlled watch wherein the high-frequency of a quartz crystal is scaled down to produce low-

frequency pulses. These pulses actuate a time display by means of a tuning fork motor whose sole function is to turn the hands of the watch. The module is constituted by an oscillator circuit, the output of which is fed to a multi-stage frequency divider, the oscillator circuit and divider being embodied in a single package containing integrated circuitry. The module is joined to an incrementally-adjustable capacitor unit for tuning the oscillator circuit. Extending from the module are five terminal lugs and one connecting tab, the first two providing support for and connections to a quartz crystal assembly mounted below the tuning unit. The second and third lugs are connectable to a power cell, while the fifth lug which yields the system out-put pulses, is connectable to the tuning fork motor. The tab serves to connect the tuning unit to the oscillator circuit.

3,748,846

TIME-KEEPING APPARATUS

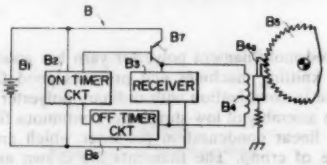
Tomio Kikuchi, Tokorozawa-shi, Saitama-ken, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Mar. 16, 1971, Ser. No. 124,759

Claims priority, application Japan, Mar. 27, 1970, 45/25727

Int. Cl. G04c *13/10*

U.S. Cl. 58—26 R **1 Claim**



The time-keeping apparatus comprises a timer unit capable of emitting time signals and an indicating unit having time-indicator such as hour and minute hands. The timer unit emits a time signal wave such as a supersonic wave at constant intervals by means of a synchronous motor serving as the reference of time. Communication between the timer unit and the time-indicating unit is effected by a wireless system. A signal receiver incorporated in the time-indicating unit is rendered to the condition of being able to receive a time signal a little before this signal wave is emitted to function so that, upon receipt of same, it drives a time-indicator actuating mechanism. Thereafter, the receiver is relieved of this condition. The time-indicator actuating mechanism thus driven causes the hands to be displaced in their positions in accurate agreement with the advancement of time.

3,748,847

WRIST-WATCH WITH SELECTIVE TIME-DISPLAY

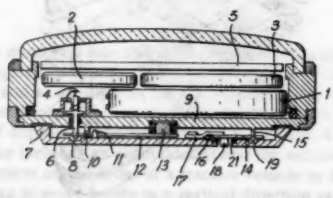
Akihiko Kouchi, Owa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 28, 1972, Ser. No. 293,261

Claims priority, application Japan, Sept. 30, 1971, 46/76688

Int. Cl. G04b *19/30*

U.S. Cl. 58—50 R **6 Claims**



A battery operated wrist-watch having an electrically powered time-display is so arranged that said display is activated only at the selection of the wearer, the objective being to conserve energy. A switching arrangement is provided which is operated by rotation of the wearer's arm to bring the wrist-watch into view. Consequently, the time-display can be activated without the use of the wearer's other hand to push a button or the like.

3,748,848

DAY-DATE TIMEPIECE

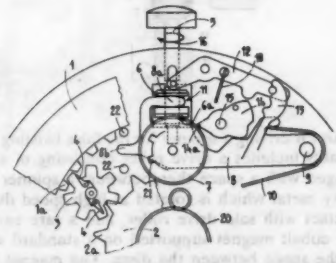
Claude Laesser, Boudevilliers, and Robert Lambert, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Oct. 18, 1972, Ser. No. 298,802

Claims priority, application Switzerland, Oct. 29, 1971, 15766/71

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **17 Claims**



A calendar timepiece provided with a control mechanism comprising a stem arranged in such a way as to be able to occupy at least two different axial positions, the mechanism comprising, a movable member acting as a selector and which is controlled, at least indirectly, by the stem, the selector being arranged in such a way as to be able to occupy one or the other of two positions, according to the direction in which the stem is rotated, when it occupies one of its two axial positions, called of selection, while, when the stem occupies another axial position, called of work, its rotation produces, according to the position previously given to the selector, either the correction of the date indicator alone or the day and date indicators, or the setting of the hands of the timepiece.

3,748,849

WATER-PROOF WRIST WATCH CASE HAVING OVAL GLASS PROFILE

Tooru Takagi, Kokubunji, Japan, assignor to Orient Watch Company, Ltd., Tokyo, Japan

Filed June 23, 1971, Ser. No. 156,010

Claims priority, application Japan, Nov. 13, 1970, 45/112695

Int. Cl. G04b *37/08*

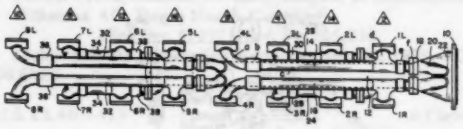
U.S. Cl. 58—90 R **2 Claims**

A rim member having an oval inner profile is overlaid on a round watch glass and figures on a dial are arranged along the periphery of an oval complementary to the inner profile of said rim member.

3,748,850
EXHAUST SYSTEM FOR A DIESEL ENGINE

Edmund H. von Hoevel, and Robert A. Bolte, both of Jeannette, Pa., assignors to Hanlon & Wilson Company, Jeannette, Pa.

Filed Oct. 18, 1971, Ser. No. 189,948
Int. Cl. F02b 37/04
U.S. Cl. 60—13 8 Claims

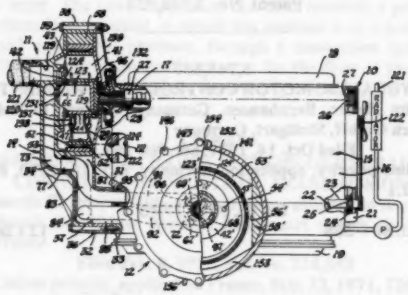


An exhaust system for a high-performance diesel engine in which at least one of the engine cylinders exhausts directly into a turbocharger associated with the engine and the balance of the engine cylinders exhaust into regions of lower pressure in a main pipe in communication with the turbocharger. The system provides the best features of a constant velocity and a constant pressure system.

3,748,851
HYDROSTATIC TRANSMISSION POWER PACKAGE

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1971, Ser. No. 196,362
Int. Cl. F01p 3/00; F16h 39/00
U.S. Cl. 60—19 26 Claims

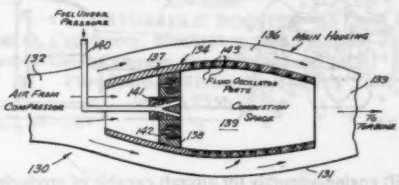


A unitary power assembly including an internal combustion engine and a hydrostatic transmission having a pump hydrostatic unit and two motor hydrostatic units mounted directly on the engine housing. The engine and a hydrostatic unit have a common housing member and a common fluid cooling system. In one modification the camshaft is the engine power output shaft driving the pump, the engine cooling system crossover and outlet passage member is a part of the pump housing, the hydrostatic transmission power circuit passages are within the common cooling fluid cavity and the motors are fluid cooled to provide a common engine and hydrostatic cooling system substantially completely enclosing the hydrostatic transmission for cooling and silencing. In another modification the pump is driven by the engine crankshaft and the hydrostatic transmission power transfer passages are provided by a manifold.

3,748,852
SELF-STABILIZING PRESSURE COMPENSATED INJECTOR

Larry E. Cole, 13042 Cherbourg St., New Orleans, La., and John M. Zabsky, 242 W. Franklin, Apt. 405, Minneapolis, Minn.

Filed Dec. 5, 1969, Ser. No. 882,583
Int. Cl. F02g 1/00
U.S. Cl. 60—39.65 17 Claims

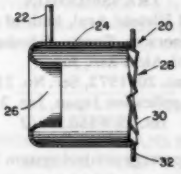


A construction for stabilizing pressure conditions in a combustion chamber, in flow passages, or the like, utilizing fluid amplifier principles to achieve the desired stabilization. The passages carrying fuel or oxidizer, or both types of passages, are formed with diverging outlet portions and these outlet portions are provided with auxiliary passages located so as to respond to abnormal local pressure conditions and to control the flow of fluid through said outlet portions in a manner to compensate for the abnormal local pressure conditions. In one form, the auxiliary passages are exposed to the interior of a combustion chamber at points spaced from the outlet ports and sense abnormal local pressure conditions in the regions of the ports, operating as fluid amplifiers to produce compensating flow conditions in the fluid traversing the diverging passages. In another form, the auxiliary passages are in the walls of a burner, by-passing parts of the main diverging outlet passage portions and acting to oscillate the outlet streams between the outlet passage portions, greatly increasing the fuel surface area exposed to the oxidant, creating substantial turbulence, and, thereby improving combustion efficiency and reducing pollution of the surrounding environment.

3,748,853
SWIRL CAN PRIMARY COMBUSTOR

Robert E. Jones, Berea, and Richard W. Niedzwiecki, Cleveland Heights, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 27, 1971, Ser. No. 192,970
Int. Cl. F02c 1/00
U.S. Cl. 60—39.65 4 Claims



A swirl can full annulus combustor operable over a wide range of exit average temperatures is used in a high performance gas turbine engine for advanced aircraft. A large number of swirl can modules are mounted in an array in each combustor.

3,748,854

LIFT ENGINE

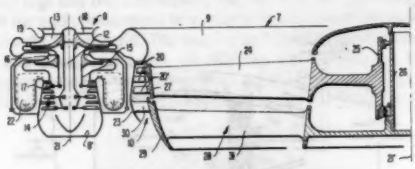
Ralph Vedova, Munich, Germany, assignor to Motoren-und Turlinen-Union Munich GmbH, Munich, Germany

Filed Sept. 24, 1971, Ser. No. 183,367

Claims priority, application Germany, Sept. 29, 1970, P 20 47 781.0

Int. Cl. F02k *3/04*

U.S. Cl. 60—226 R **21 Claims**



A lift engine assembly for aircraft capable of producing lift and/or thrust having a tip turbine operated lift fan with at least one gas turbine engine being arranged about the circumference of the lift fan.

3,748,855

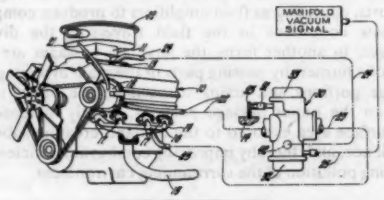
REACTOR AIR FLOW CONTROL VALVE

Edward G. Day, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 20, 1972, Ser. No. 245,993

Int. Cl. F02b *75/10*

U.S. Cl. 60—290 **10 Claims**



A reactor air flow control valve for use in the exhaust reactor system of an internal combustion engine of the type in which an engine driven air pump delivers air to the stream of exhaust gases as they are emitted from the combustion chambers, the valve controlling air flow from the air pump to the exhaust reactor system as a function of reactor temperatures and back pressure.

3,748,856

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Somio Uozumi, and Hiroshi Arai, both of Aichi-ken, Toyota-shi, Japan, assignors to Toyota Jidosha Kogyo Kalushiki Kaisha, Toyota-shi, Aichi-ken, Japan

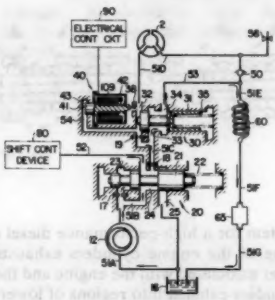
Filed Jan. 20, 1972, Ser. No. 219,267

Claims priority, application Japan, Jan. 21, 1971, 46/1392

Int. Cl. F16d *33/12*

U.S. Cl. 60—357 **9 Claims**

A circulating oil passage control system for hydraulic automatic transmissions, comprising a pressure regulator valve adapted to regulate the pressure of oil delivered by an oil pump to supply hydraulic pressure to a shift control device of a planetary gear unit, and an oil passage control valve provided in oil circulation conduits directed through a torque converter to a lubrication circuit operated by an electromagnetic control valve to control the flow of pressure oil so that the oil is directed to the lubrication circuit through the torque converter or through a short-circuited conduit without passing through the torque converter. The electromagnetic control valve is provided with an electrical control circuit which energizes or de-energizes the control valve in conformity with engine cooling water temperature, representing the condition of the engine during warm-up, and the number of engine revolutions. When the water temperature is low in cold weather and the number of engine revolutions is low, the electromagnetic control valve is de-energized to switch the oil passage control



valve so that the pressure oil is not supplied to the torque converter. When the number of engine revolutions exceeds a predetermined value, the electromagnetic control valve is energized and the pressure oil is supplied to the torque converter by the oil passage control valve. Furthermore, when a vehicle starts to move from a stationary position, the pressure oil is applied to the electromagnetic control valve through a feedback circuit to maintain the energizing operation of the electromagnetic control valve.

ERRATUM

For Class 36—73 see:
Patent No. 3,748,951

3,748,857

HYDRAULIC MOTOR CONTROL ARRANGEMENT

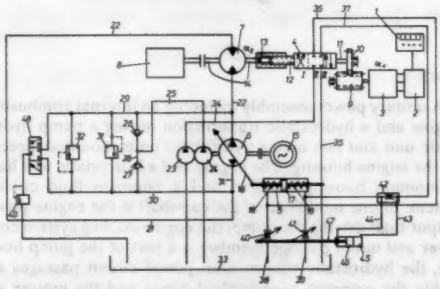
Joachim Heiser, Bernhausen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 14, 1971, Ser. No. 189,183

Claims priority, application Germany, Oct. 16, 1970, P 20 50 882.1

Int. Cl. F16h *39/46*

U.S. Cl. 60—388 **12 Claims**



A control arrangement for driving a hydraulic motor in which the input signal is derived from a pulse generator. A step motor converts the pulses from the pulse generator into mechanical position and positions correspondingly a servo valve. The output shaft of the hydraulic motor is also con-

nected to the servo valve which compares the outputs of the step motor and hydraulic motor, and adjusts a hydraulic pump through a displacement cylinder so that the output of the hydraulic motor is substantially equal to the output of the step motor.

3,748,858

APPARATUS FOR CONTROLLING THE PRESSURE AT THE INPUT OF CASTING MACHINES

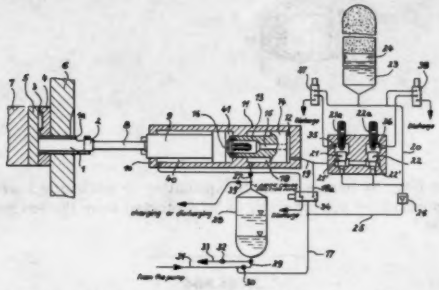
Willibald Venus, Munich, Germany, assignor to Gusstahlwerk Wittmann AG, Hagen-Haspe, Germany

Filed Dec. 8, 1971, Ser. No. 205,920

Claims priority, application Germany, Dec. 10, 1970, P 20 60 681.9

Int. Cl. F15b *1/02, 3/00*

U.S. Cl. 60—413 **6 Claims**



A multiplier cylinder, divided by a multiplier piston into a feed chamber and a counterpressure chamber, is associated with the input of a casting machine, particularly with a die casting machine, to control the operating pressure sequence at the input. The counterpressure chamber receives a pressure medium from a vessel, in which the medium is at a predetermined continuous pressure, through a connection having a relatively large cross-sectional area for the flow of the pressure medium so as to reduce the choking effect.

3,748,859

REFEED AND DISCHARGE SYSTEMS OF HYDRAULIC CIRCUITS OF HYDROSTATIC TRANSMISSIONS

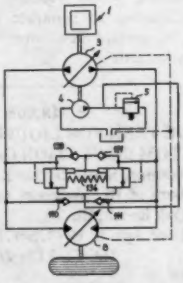
Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France

Filed Feb. 8, 1972, Ser. No. 224,553

Claims priority, application France, Feb. 23, 1971, 7106089

Int. Cl. F16h *39/02*

U.S. Cl. 60—464 **8 Claims**



A device for refeeding and discharging the hydraulic circuits of a hydrostatic transmission in which the chambers disposed at the ends of a main bore connected to a compensating pump form with said bore two shoulders constituting the seats of refeed and discharge valves comprising each a flange adapted to engage in a fluid-tight manner one of the shoulders, the refeed valves comprising furthermore first and second bores interconnecting the two ends of the valves, the first bore having a greater diameter and opening towards the main bore, each discharge valve being disposed coaxially in the refeed valve and engaging the respective seat.

3,748,860

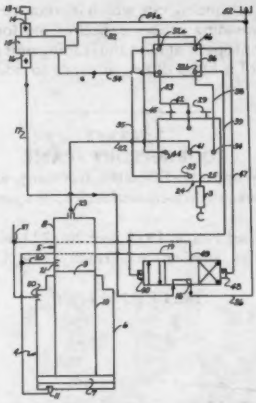
HYDRAULIC BOOSTER

Joseph C. Castleberry, Birmingham, Ala., assignor to Altec Manufacturing Company, Inc., Birmingham, Ala.

Filed Feb. 5, 1971, Ser. No. 112,955

Int. Cl. F15b *7/00*

U.S. Cl. 60—563 **5 Claims**



The disclosure hereof is of an hydraulic power amplifier or intensifier which includes a drive unit and a driven unit formed of large and small piston elements respectively, interconnected so as to be simultaneously operable, pressure applied to the larger of the units being calculated to in turn produce at the output end of the driven unit large pressures for operating various types of devices such as those used in utility construction and maintenance including cutters, swagers and the like, the disclosure providing a portable unit incorporating various controls which are desirable in the elements under consideration, and particularly making provision for pre-charging the system which produces the high pressure and applies the same to the operating tools. Control of the intensifier is effected by hand manipulation remotely arranged and connected so as to avail of low pressure for activating higher pressure elements or instrumentalities, the pre-charging arrangement serving to maintain the system at full pressure without air pockets and likewise acting to grip or hold parts initially prior to ultimate manipulation by the pressures supplied.

3,748,861

MINE ROOF SUPPORT WITH MEANS FOR LIFTING THE BASE ELEMENTS

Karl Maria Groetschel, Stolzestrasse 44, 463 Bochum, Germany

Filed June 16, 1972, Ser. No. 263,472

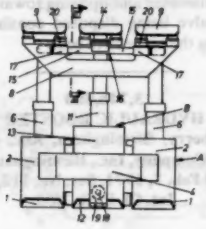
Claims priority, application Germany, June 16, 1971, P 21 29 749.4

Int. Cl. E21d *15/50*

U.S. Cl. 61—45 D **16 Claims**

The invention provides an advancing mine roof support in which successively advanced units each comprise a base ele-

ment, hydraulic props thereon and a superstructure carried by the props with the base element and superstructure of an inner one of the units disposed in longitudinally extending medial gaps afforded by the base element and superstructure of an outer one of the units, the base element being connected by a



double-acting advancing ram which is connected hydraulically in a circuit providing pressurisation of the foremost double-acting prop or props of at least the leading unit so that the base element thereof is lifted during advance to ride over floor obstructions.

3,748,862

ROOF SUPPORT FRAME

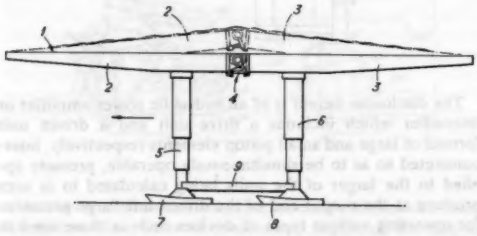
Josef Welzel, Wuppertal-Elberfeld, Germany, assignor to Hermann Hemsckeidt Maschinenfabrick, Wuppertal-Elberfeld, Germany

Filed Feb. 4, 1972, Ser. No. 223,504

Claims priority, application Germany, Feb. 8, 1971, P 21 05 795.4

Int. Cl. E21d *17/00*

U.S. Cl. 61—45 D **4 Claims**



A roof-support frame for use in mines comprising front and rear upright hydraulic props which support, at their upper ends, an articulated roof-support beam having two pivotally-connected beam parts which are thus able to swivel relatively to each other in a horizontal plane, there being a deformable arched blocking plate located in a space between the opposing ends of the two beam parts to limit the extent of relative swivelling movement between the latter parts in one direction.

3,748,863

CONNECTION FOR A NONMETALLIC FOUNDATION PILE

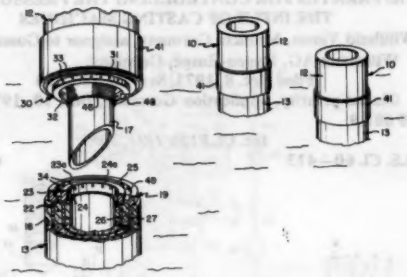
Ivo C. Pogonowski; Paul D. Carmichael, and Edward E. Bodor, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,877

Int. Cl. E02d *5/22*; F16l *25/00*

U.S. Cl. 61—53 **3 Claims**

The invention relates to a pile or foundation member particularly adapted for use in offshore or similar applications, wherein a hostile environment or a severe corrosion problem is a pertinent factor. The pile comprises an elongated member formed essentially of a series of reinforced concrete pile sections. A metallic cap carried at each pile section end is adapted to engage and be fixed to a corresponding cap on the next succeeding pile end whereby to define a rigid interface connection between the two. The metal joint thus formed between the concrete sections is then isolated from its surroundings by means of an encapsulating or enclosing barrier formed on the pile whereby to be protected from the environment.



3,748,864

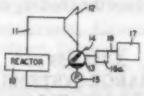
PROCESS FOR RECOVERY AND CONTAINMENT OF RADIOACTIVE GASES

Anthony Lofredo, Springfield, N.J., and David H. Goldschmidt, Forest Hills, N.Y., assignors to Airco Inc., New York, N.Y.

Filed Jan. 21, 1969, Ser. No. 792,650

Int. Cl. F25j *3/00, 3/06*

U.S. Cl. 62—22 **16 Claims**



This invention relates to apparatus and methods for the removal and safe containment of radioactive krypton and xenon present in the air leakage stream of a nuclear plant utilizing a boiling water reactor. The invention utilizes cryogenic techniques to separate the xenon and krypton isotopes from the air and then stores the same until they are no longer a safety hazard.

3,748,865

STORAGE TANK FOR LIQUEFIED GAS HAVING BOTTOM INSULATION GAS SHIELDING

Royce Jay Laverman, South Holland, and Govind M. Agrawal, Plainfield, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

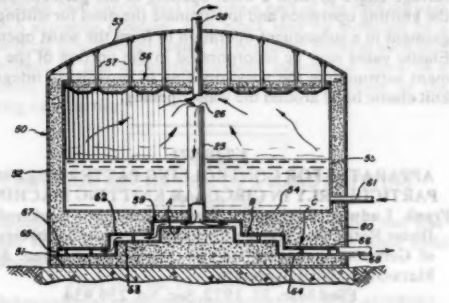
Filed Apr. 6, 1971, Ser. No. 131,716

Int. Cl. F17c *7/02*

U.S. Cl. 62—50 **1 Claim**

An enclosed liquefied gas storage tank with a bottom, side wall and roof having a chamber positioned in insulation beneath the tank bottom and extending over the area of the tank bottom, a vapor supply conduit extending from, and

communicating with, a vapor space above the design maximum liquid level storage capacity of the tank to, and in com-



munication with, the chamber, and a vapor removal conduit communicating with the chamber for withdrawing vapor from the chamber after circulating therethrough.

3,748,866

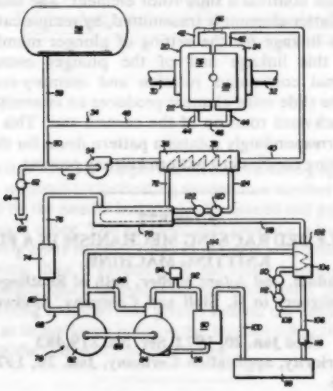
METHOD AND APPARATUS FOR CHILLING MOLD ELEMENTS

James Elmer Heider, Toledo, and Thomas H. Schult, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 23, 1971, Ser. No. 136,861

Int. Cl. F25d *17/02*

U.S. Cl. 62—99 **2 Claims**



This disclosure relates to a method and apparatus for continuously chilling or cooling mold parts which are subjected to heated products, such as the die elements of a plastic blow molding apparatus. More particularly, the disclosed method and apparatus is adapted to maintain a predetermined mold chilling temperature to permit rapid forming of plastic articles and reduce the dwell time of the plastic article within the mold. The disclosed apparatus includes a heat exchanger-evaporator, a first liquid coolant loop communicating with the heat exchanger and the mold parts to be cooled, wherein low viscosity liquid coolant is pumped through the heat exchanger and the mold parts to chill the mold parts, and a second coolant loop communicating with the evaporator within the heat exchanger and including a compressor, condenser and expansion valve. The coolant in the second coolant loop is evaporated by the expansion valve, within the evaporator of the heat exchanger, to absorb heat from and chill the coolant within the first coolant loop.

3,748,867

APPARATUS TO OBTAIN FRESH WATER FROM MOISTURE CONTAINING AIR

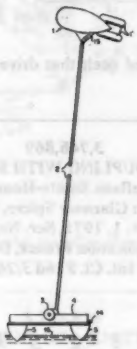
Bernard Andre Bel Hamri, Immeuble l'Horizon, Ave. Delafosse, Abidjan - PB: 675, Ivory Coast

Filed Jan. 26, 1972, Ser. No. 220,869

Claims priority, application France, Nov. 10, 1971, 7140226; Nov. 22, 1971, 7141644

Int. Cl. F25d *23/00*

U.S. Cl. 62—271 **9 Claims**



An elongated flexible tube has its upper end attached to a lighter-than-air balloon, preferably in the form of a non-rigid air ship (blimp), the length of the tube being sufficiently great to extend from about ground level to a temperature zone having a climatic condition in which the temperature or moisture distribution of the atmosphere is sufficiently different from that at ground level to permit, either, condensation of moisture as moisture-containing atmosphere is conducted upwardly into the tube or introduction of seed crystals, such as silver iodide, into the atmosphere to cause precipitation. In the first case, the tube is preferably terminated at its lower end at an opening spaced a short distance above a large body of water, such as an ocean, and maintained on floats or pontoons located in the sub-tropical or tropical regions, moisture-laden air from the ocean being drawn into the tube so that the water only will condense on the tube walls, at the upper atmospheric reaches thereof, to be drawn off and collected. In the second case, when seed crystals are to be introducted, the tube is preferably mounted on an automotive vehicle for wide dispersion of seed crystals.

3,748,868

ELASTIC COUPLING

Rene Poget, 2000 Neuchatel, Switzerland, assignor to Fabrique de Machines Andre Bechler S.A., Canton of Berne, Switzerland

Filed Dec. 1, 1971, Ser. No. 203,523

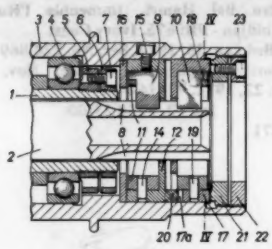
Claims priority, application Switzerland, Dec. 8, 1970, 18156/70

Int. Cl. F16d *3/52*

U.S. Cl. 64—15 B **4 Claims**

This invention concerns an elastic coupling suitable for transmitting drive to a machine tool and comprising two series of generally radially extending spring strip elements, e.g. of spring steel laminate construction, anchor means for anchoring radially inner and outer portions of each spring strip element of each series so as to be sprung and inclined circumferentially to the radius, the spring strip elements of one series

being inclined in an opposite circumferential sense to the spring strip elements of the other series and drive input and



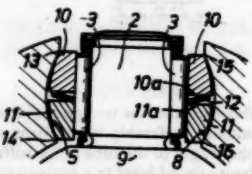
output means arranged such that drive is transmitted via the spring strip elements.

3,748,869

TRANSMISSION COUPLING WITH SPHERICAL ROLLER

Michel Orain, 78 Conflans Sainte-Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed Nov. 1, 1971, Ser. No. 194,648
Claims priority, application France, Dec. 4, 1970, 7043789
Int. Cl. F16d 3/28
U.S. Cl. 64—17 A 6 Claims



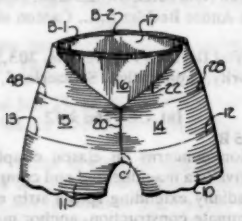
This invention relates to a transmission coupling with a spherical roller. The spherical roller is pivotally mounted on a spindle with or without the interposition of pins for rolling movement in two opposed grooves formed in a jaw. The roller includes two half rollers symmetrical about a plane perpendicular to the spindle and including a great circle of the sphere formed by the roller. A resilient member which may be a Belleville washer or a ring of elastomeric material is interposed between the planar and parallel surfaces of the half rollers facing each other.

3,748,870

SEAMLESS KNIT LOWER BODY GARMENT AND METHOD OF MAKING SAME

Oscar Fregeolle, Hickory, N.C., assignor to Pilot Research Corporation, Valdese, N.C.

Filed Oct. 4, 1971, Ser. No. 186,344
Int. Cl. D04b 23/00
U.S. Cl. 66—177 10 Claims



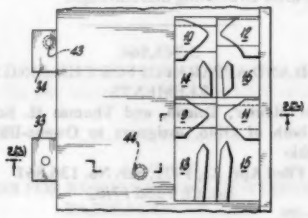
The garment includes a panty portion formed of fashioned gussets and a pair of legs integrally knit with the panty portion. The legs may be short to provide a panty, panty girdle and the like or they may be long and provided with foot portions to form tights, leotards, panty hose and the like. Fashioned front and rear gussets of the panty portion are provided with knit selvage edges to form a waist opening in the garment during the knitting operation and to eliminate the need for slitting the garment in a subsequent operation to form the waist opening. Elastic yarns may be incorporated in the portion of the garment surrounding the waist opening to provide an integrally knit elastic band around the waist opening.

3,748,871

APPARATUS FOR CONTROLLING PATTERN DRUMS PARTICULARLY IN CIRCULAR KNITTING MACHINE

Frank Ludwig, Burgstadt; Konrad Bannehr, Leukersdorf; Dieter Rothe, and Werner Tschischke, both of Mittweida, all of Germany, assignors to VEB Wirkmaschinenbau, Karl-Marx-Stadt, DDR, Germany

Filed Mar. 31, 1972, Ser. No. 239,934
Int. Cl. D04b 9/00
U.S. Cl. 66—50 B 10 Claims



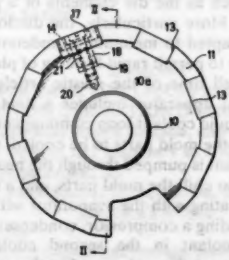
A pattern setting memory device controls a vertical stepped slider, and thereby controls a horizontal adjustment slider, which in turn controls a slide rotor element. The sliding motion of the latter element is transmitted, by reciprocating cam motions, to linkage for the setting of plunger members. By means of this linkage and of the plunger members, a unidirectional continuous rotation and memory-controlled sliding of the slide rotor element produces an intermittent forward or backward rotation of the control star. This star, by gearing, correspondingly rotates a pattern drum for the selection of knitting needles in a pattern knitting process.

3,748,872

NEEDLE BED RACKING MECHANISM IN A FLAT KNITTING MACHINE

Wilhelm Hadam, and Adam Muller, both of Reutlingen, Germany, assignors to H. Stoll and Company, Stollweg, Germany

Filed Jan. 20, 1972, Ser. No. 219,483
Claims priority, application Germany, Jan. 20, 1971, P 21 02 45 002.6
Int. Cl. D04b 7/00
U.S. Cl. 66—69 10 Claims



A racking cam for producing needle bed shogging steps of respectively different extents in a flat knitting machine. A

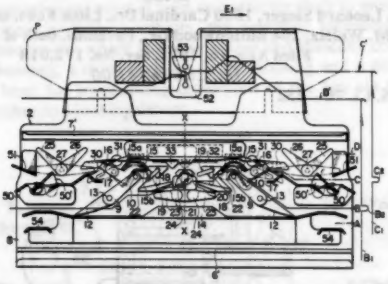
racking cam carrier carries about its periphery a racking cam having a plurality of shogging positions. Each shogging position includes a device for varying the form of the cam at that position. The device may include a block on the periphery of the racking cam carrier and forming a part of the racking cam at each shogging position. This block may be mounted by a connecting structure including an eccentric element such that movement of this eccentric element moves the block in a direction generally parallel to the axis of rotation of the racking cam carrier.

3,748,873

CARRIAGE MECHANISM OF A HAND KNITTING APPARATUS

Kazushige Nakane, Toyota; Tadashi Honmi, Handa, and Katsumi Koike, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed July 26, 1971, Ser. No. 165,978
Claims priority, application Japan, July 6, 1970, 45/68783
Int. Cl. D04b 7/00
U.S. Cl. 66—78 R **7 Claims**



A carriage slidably supported on hand knitting apparatus to impart a required reciprocating motion to a number of needles arranged on the needle bed in equally spaced and parallel relation to each other. The carriage may produce a higher lift of the knitting cams or lifter cams in the skip stitch mode for the needle butts than is produced in the other knitting mode by using unused space assigned to the other path used in the other knitting mode so that getting behind the latches may be ensured as to the loops lying on the needles other than that on which lies the skip stitch loop or loops.

3,748,874

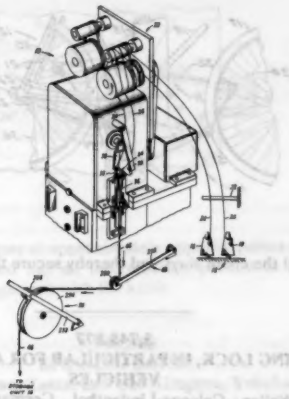
YARN KNITTING MACHINE

Robert C. Blezard, Woonsocket, R.I., assignor to Smithfield Fibers, Inc., Providence, R.I.

Filed Oct. 23, 1970, Ser. No. 83,588
Int. Cl. D04b 23/00
U.S. Cl. 66—86 **12 Claims**

A knitted yarn and a method and apparatus for knitting the yarn. The yarn comprises two strands formed into successive stitches alternately disposed about two needle axes. Alternate strands form the successive stitches along each axis. Each stitch on one axis is drawn through a preceding stitch on that axis. As a result, each stitch on each strand passes through an adjacent stitch formed of the other strand.

Each stitch in a strand is formed at a single or one of two reciprocating latch needles which pull the newly formed stitches in each strand through preceding stitches in the other strand and cast off the preceding stitches. Then the needles extend to accept the next stitches formed in the strands. The yarn knitting apparatus feeds strands at a controlled rate to service bars which reciprocate and oscillate over the needles



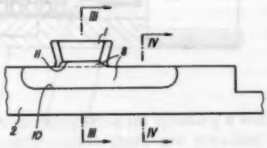
to form the stitches at the needles alternately each time the needles reciprocate.

3,748,875

WORKING ELEMENT OF A KNITTING MACHINE PROVIDED WITH AT LEAST ONE BUTT

Alois Slof, and Vladimir Smejkal, both of Brno, Czechoslovakia, assignors to Vyzkumny ustav pletarsky, Brno, Czechoslovakia

Filed May 19, 1971, Ser. No. 144,808
Claims priority, application Czechoslovakia, May 20, 1970, 3492 70; May 22, 1970, 3570 70
Int. Cl. D04b 35/02
U.S. Cl. 66—123 **9 Claims**



A working element of a knitting machine such as a needle, an auxiliary needle, or a closing sinker, provided on its shaft with at least one butt cooperating with the cam effecting the movement of the working elements in the bed, in which the butt is joined with the shaft by means of an elastic beam which lessens the severity of the impacts between the butt and the cam.

3,748,876

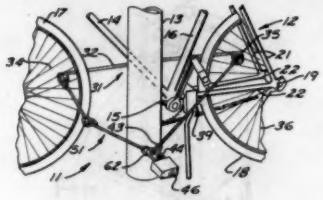
BIKE SECURITY DEVICE

Thomas R. Mathews, 2029 H St., Sacramento, Calif.

Filed Nov. 8, 1971, Ser. No. 196,513
Int. Cl. E05b 73/00
U.S. Cl. 70—18 **1 Claim**

A first elongated rod of hardened metal comprises a first link which spans both wheels of a bike and can also encompass, if desired, a sturdy post, or the like, against which the bike is leaned for support. A second link member comprises another rod which is shorter than the first and is articulated to one end of the first link. A third link member, preferably comprising two or more articulated link portions, is articulated to the other end of the first rod. The second and third link members are joined together at their free ends by lock means on the side of the bike opposite to that occupied by the first link.

The three rods not only lock the wheels but also pass through the triangular frame member formed by the seat tube, the seat



stays and the chain stays and thereby secure the wheels to the frame.

3,748,877

STEERING LOCK, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

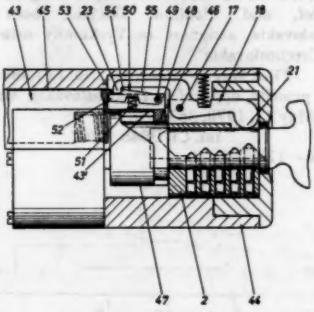
Heinz Wolter, Cologne-Lindenthal, Germany, assignor to Firma Josef Voss KG, Cologne, Germany

Filed June 9, 1971, Ser. No. 151,262

Claims priority, application Germany, June 10, 1970, P 20 28 475.7

Int. Cl. B60r *25/02*

U.S. Cl. 70—186 **5 Claims**



A steering lock equipped with a locking cylinder, in particular for automotive vehicles which comprises a steering spindle and a bolt forced by a spring force into its locking position and blocking the steering spindle against rotation. A lever-like locking member secures the bolt against undesired blocking of the steering by resiliently engaging with its end in open position of the bolt and rigidly mounted in a lock housing. The locking member is releasible by means of a key operating the tumblers, such that the release takes place only after almost completed removal of the key. The bolt has a bolt tail including a latch. An immovable pin supports rotatably the locking member, and the latter enters in its locking position behind said catch-like yieldingly mounted latch of the bolt tail.

3,748,878

DOOR LOCK ELECTRICAL CONTROL UNIT

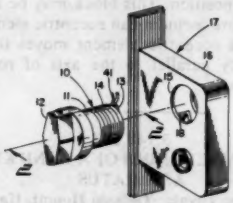
Alfiero F. Balzano, Placentia, and John F. Regan, Anaheim, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 7, 1971, Ser. No. 150,605

Int. Cl. E05b *47/00*

U.S. Cl. 70—218 **5 Claims**

An electrically controlled manual operating unit for a door lock, adapted to be assembled in place of conventional manually operated means on the lock. The housing of the unit is shaped like a usual type of key controlled tumbler cylinder, and mounts a knob in freely rotatable relation to a lock actuating cam. The cylinder contains a solenoid that must be energized to engage a clutch in order to permit rotating movements of the knob to rotate the cam.



3,748,879

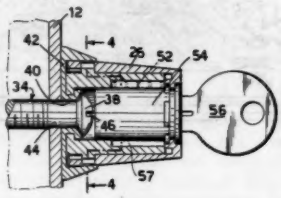
DEVICE FOR SECURING ARTICLES ON A MOUNTING BASE

M. Leonard Singer, 1500 Cardinal Dr., Little Falls, and Robert M. Woletz, 294 Buttonwood Dr., Paramus, both of N.J.

Filed Aug. 16, 1971, Ser. No. 172,018

Int. Cl. F16b *41/00*

U.S. Cl. 70—232 **3 Claims**



A device for locking a holding bolt which is engaged with an article such as a typwriter, radio set, etc., for securing it on a mounting base in order to prevent pilfering thereof comprises a first tubular member having an end wall with a substanitally flat exterior face which is adpated to be positioned against the mounting base for the article. The end wall has an opening therethrough for the shank of a bolt which is of a size to permit passage of the shank but prevent withdrawal of the bolt which has either a nut threaded thereon or a widened head portion. The first tubular part includes a widened base portion which forms an annular groove around an upstanding central tube portion. The upstanding tube has a porjecting portion on each diametrically opposite side which engages within a recess defined from the bottom edge of a second tube which is engaged over the upstanding first tube. The annular edge of the second tube fits in the recess formed between the widened base portion and the upstanding tubular portion. The projection of the upstanding first tubular part and the second tubular part may be rotated to position the projection of the first tubular part behind a blocking shoulder which prevents withdrawal of the two tubular elements. The second tubular part includes a locking mechanism in the form of projecting elements which engage in diametrically opposite longitudinally extending grooves on the interior of the first tubular part and prevents relative rotatin when the projections extend outwardly. The projections are made to move inwardly to permit relative rotation of the two cylinders and hence withdrawal of one in respect to the other when a key is positioned in the lock to move them out of an operative position.

3,748,880

LOCK ASSEMBLIES PARTICULARLY SUITABLE FOR MOTOR VEHICLES

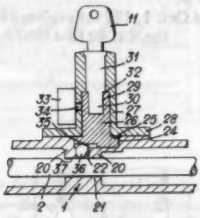
Barry Keith Atkins, Sittingbourne, Kent, England, assignor to Waso Limited, Kent, England

Filed Mar. 17, 1971, Ser. No. 125,264

Claims priority, application Great Britain, Mar. 18, 1970, 13,049/70; May 8, 1970, 22,375/70; Oct. 9, 1970, 48,171/70

Int. Cl. B60r *25/06*

U.S. Cl. 70—248 **1 Claim**



A lock assembly particularly, but not exclusively, for use in conjunction with a vehicle gear box selector shaft housing for locking against movement at least one selector shaft to immobilise at least partially a vehicle, the assembly including a locking mechanism which is key-operated and basically comprises a housing, a drive member in the housing and a drive member head for transmitting movement of the key via the drive member to a locking detent.

3,748,881

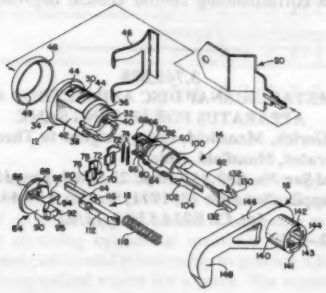
KEY EJECTOR LOCK

Lloyd A. Erickson, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 4, 1972, Ser. No. 215,328

Int. Cl. E05b *17/00*

U.S. Cl. 70—388 **6 Claims**



A key ejector lock including a spring loaded coaxially disposed bar member extending into the key way of the lock so as to maintain a constant ejecting bias force on a key and all angular positions of said lock. The ejector mechanism is suited for use in a non-thermal conducting device for locking refrigerator devices where safety factors require ejection of keys to avoid shoulder tampering with such devices.

3,748,882

SECURITY LOCK

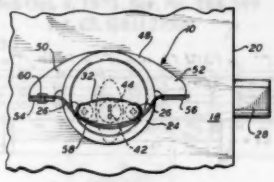
Raymond A. Dusault, Jr., 59 S. Wyoming Ave., and Frank R. Fasulo, 301 S. Orange Ave., both of South Orange, N.J.

Filed Oct. 13, 1971, Ser. No. 188,719

Int. Cl. E05b *13/00*, *17/00*

U.S. Cl. 70—416 **3 Claims**

A lock, ordinarily operable by a key from the outside and by a non-circular knob from the inside, is secured against being unlocked from the outside by picking or by a key. Such security is derived from a saddle which is held at end portions thereof in positions at approximately opposite points adjacent to said knob and has an intermediate portion in rotation-preventing engagement with the knob.



3,748,883

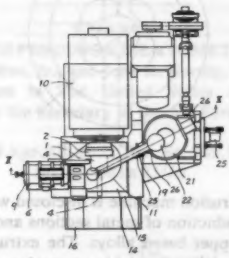
SPINNING LATHE

Yoshimi Ashizawa, Zama, and Isao Kitagima, Yokohama, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 3, 1972, Ser. No. 214,870

Int. Cl. B21d *22/18*

U.S. Cl. 72—81 **5 Claims**



In a hot or cold spinning lathe for spinning a workpiece to a predetermined configuration there are provided means for rotatably mounting the workpiece on a headstock, a saddle mounted to be movable relative to the headstock in the axial direction thereof, a swivel head rotatably mounted on the saddle, a working tool mounted on the swivel head to be movable toward the center of the swivel, crank means for imparting a swivelling motion to the swivel head, means to vary the eccentricity of the crank means and a slide mounted on the saddle for supporting the crank means and the means for varying the eccentricity thereof, and means mounted on the saddle for sliding the slide on the saddle for adjusting the angle of swivelling of the swivel head.

3,748,884

ROLL-FORMING MACHINE

Dan L. Colbath, P.O. Box 1003, Sherman, Tex.

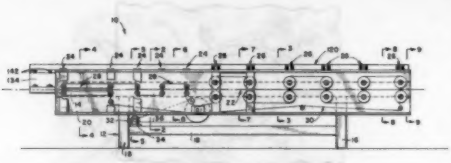
Filed Sept. 20, 1971, Ser. No. 181,838

Int. Cl. B21d *5/06*

U.S. Cl. 72—238 **22 Claims**

A roll-forming machine includes a plurality of forming members which are mounted at spaced points on an elongate, rigid spine. This permits conversion of the machine from one roll-forming configuration to another by removing the spine and the roll-forming members attached thereto and then installing a different spine-forming member assembly in the roll-forming machine. In one embodiment of the invention the forming members comprise non-driven material engaging rol-

lers and the roll-forming machine further includes a plurality of roll-stands each comprising non-forming driving rollers for moving material through the roll-forming machine. In another



embodiment of the invention the forming members comprise combination driving and forming rollers and couplers are provided for forming driving connections to the rollers.

3,748,885

EXTRUSION MACHINE

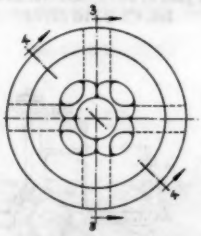
Robert Creuzet, Rte. de Blyssac, 47 Marmande, France

Filed Dec. 4, 1970, Ser. No. 97,418

Claims priority, application France, Dec. 8, 1969, 6942347

Int. Cl. B21c *25/04*

U.S. Cl. 72—269 **4 Claims**



A thermal-extrusion machine is disclosed with an extrusion head for the production of metal sections and tubes, particularly of light copper-based alloys. The extrusion head comprises a core coaxially received in an aperture of an associated die. The core is supported by bridging means in the form of webs angularly equispaced about the axis thereof. A chamber is formed in the head and downstream of the webs, to transverse section of the chamber being sufficiently small to let the pressure of the material being extruded fuse the strands formed by the material passing the webs and reuniting in the chamber.

3,748,886

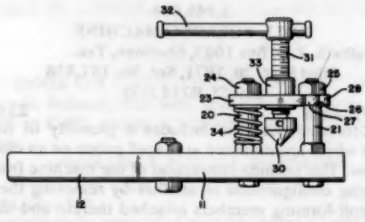
FLARING TOOL STRAP MOUNT

Glenn R. Wolcott, Dayton, Ohio, assignor to Penn Aircraft Products, Incorporated, Dayton, Ohio

Filed Oct. 27, 1971, Ser. No. 193,085

Int. Cl. B21d *41/02*

U.S. Cl. 72—316 **5 Claims**



A flaring tool having the flaring member mounted on a movable strap is provided with an improved strap mount wherein a spring retains the flaring member strap in the desired position, either open or operable, while simultaneously ensuring positive alignment of the hook portion of the flaring member strap with its associated mount, when the strap is moved to the operable position.

3,748,887

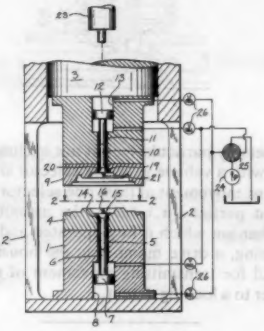
METHOD AND APPARATUS FOR LOCATING STOCK IN FORMING DIES

Otto F. Widera, South Milwaukee, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Oct. 1, 1971, Ser. No. 185,764

Int. Cl. B21d *45/00*

U.S. Cl. 72—345 **6 Claims**



Knockout pins in the opposed dies are employed to receive and index the stock between and in spaced relation to the dies, after which the dies are closed upon the work while overriding the knockout pins. For forming a symmetrical workpiece a single knockout pin is disposed centrally of each die and is provided with a conical protrusion centrally thereof registering with a corresponding central conical depression in the stock.

3,748,888

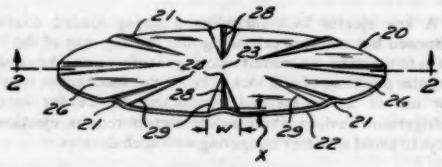
BIMETALLIC SNAP DISC AND METHOD AND APPARATUS FOR MAKING SAME

Anton J. Gerich, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Division of Ser. No. 859,853, Sept. 22, 1969, abandoned. This application June 18, 1971, Ser. No. 154,442

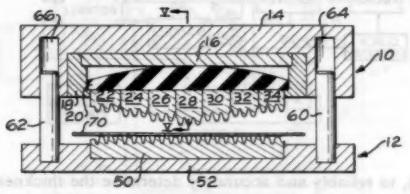
Int. Cl. B21d *53/00, 13/02*

U.S. Cl. 72—375 **13 Claims**



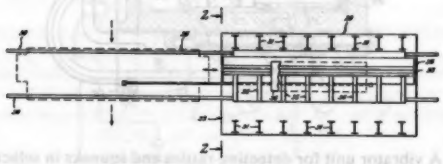
A snap disc is disclosed having peripherally spaced radially extending scallops which stiffen the disc independently of the chord height of the disc. Because of the stiffening scallops it is not necessary to utilize a large chord height when manufacturing a disc for high force or temperature operation. The disc, when formed of bimetal, can operate at high or low temperatures with a narrow temperature differential of operation. Tools for forming the disc with scallops are also disclosed.

3,748,889
APPARATUS FOR DEFORMING SHEET MATERIAL
Kenneth J. Miller, and Eugene K. Patton, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 29, 1971, Ser. No. 202,948
Int. Cl. B21d 13/02
U.S. Cl. 72—382 6 Claims



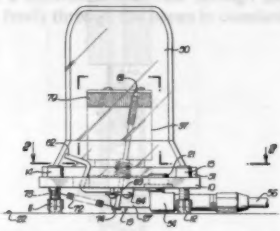
A die assembly for deforming sheets in which a first member is segmented to provide a collapsible crowned surface, and another member is substantially planar. The segments are backed by a resilient pad-like member which permits a controlled progressive loading of the segments. The assembly permits the deformation of a sheet material workpiece by means of stretching and gathering said material progressively outwardly from the central portions of said workpiece.

3,748,890
FEMALE DIE AND WORKPIECE SUPPORT ARRANGEMENT FOR A PRESS
Russell S. Thatcher, Alvin, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.
Filed Sept. 14, 1970, Ser. No. 71,795
Int. Cl. B21d 5/02, 9/05, 9/14, 31/00
U.S. Cl. 72—383 2 Claims



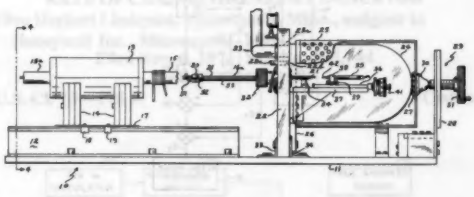
Opposed cylindrical members are provided in opposed support members or means to provide a female die for a press. A plurality of opposed support members or means may be arranged for receiving cylindrical members therein in axial alignment and end-to-end relationship to provide a female die of desired longitudinal extent for a press. The support means are each provided with cylindrical surfaces arranged in end-to-end relationship for contacting and cradling said cylindrical members substantially throughout their longitudinal extent and over a substantial portion of their circumferential extent or surface area. Thus, when a workpiece is placed on the opposed cylindrical members and engaged on the opposite side by a male die of a press to force the workpiece in the space between the opposed cylindrical members to form the workpiece, the opposed cylindrical members may freely rotate in said support memers while transmitting the load applied to the workpiece from the cylindrical members to the support members over a maximum surface area. The support members are carried on a carriage and means are provided to quickly and easily adjust and regulate the distance between the opposed cylindrical female die members as desired. A support is provided for the workpiece to support it as it is formed including a carriage mounted on rollers which is in turn engaged on tracks so that the carriage can be moved toward and away from the press.

3,748,891
PRESSURE STANDARD
William A. Music, Los Angeles, Calif., assignor to Schwien Engineering, Inc., Pamona, Calif.
Filed Oct. 4, 1971, Ser. No. 186,249
Int. Cl. G01l 27/00
U.S. Cl. 73—4 D 4 Claims



A standard for gas pressure for checking other standards and for calibrating instruments. A cylinder weight mounted on an air shaft for rotation, means for limiting up and down motion of the cylinder, means for introducing gas under pressure to the air shaft to float the cylinder on the shaft, and means for rotating the cylinder when floating to provide a positive indication of pressure. A standard for use in ambient atmosphere and in a vacuum.

3,748,892
HIGH PRECISION DILATOMETER
Jesse R. McKendree, Jr., and John R. Koenig, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Apr. 18, 1972, Ser. No. 245,151
Int. Cl. G01n 25/16
U.S. Cl. 73—16 3 Claims

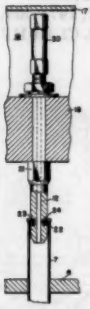


A dilatometer including a furnace, a double bar support positioned within an evacuated tube mounted in the furnace, and supporting a test specimen and an elongated push rod in contact with the specimen and extending outside the furnace into an evacuated bell jar containing a linear variable, differential transformer with its movable core placed in contact with, and adjustable by the movement imparted to the push rod by the thermal expansion of the specimen to thereby produce a voltage directly proportional to such movement and constituting the exact measure of said expansion.

3,748,893
METHOD AND APPARATUS FOR DETECTING DEFECTIVE SHELLS
Matthew L. Spillane, Tamaqua, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.
Filed June 1, 1971, Ser. No. 148,528
Int. Cl. G01m 3/02
U.S. Cl. 73—49.2 10 Claims

A method and apparatus for detecting defective shells. A friction seal is placed in the open end of the shell and the shell is held on the seal while a limited quantity of gas is supplied to

the inside of the shell at a pressure great enough to force the shell off the seal. The shell is then ceased to be held on the seal



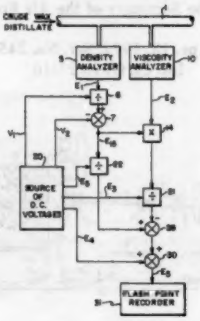
and will be forced off by the gas pressure if the gas has not escaped through a hole or the shell is not deformed. Many shells may be tested at the same time.

3,748,894

MEANS AND METHOD FOR AN ON-LINE DETERMINATION OF THE FLASH POINT OF LUBE OIL FRACTIONS

William D. White, and Charles R. Lynch, both of Port Arthur, Tex., assignors to Texaco, Inc., New York, N.Y.

Filed June 15, 1972, Ser. No. 263,062
Int. Cl. G01n *25/52*
U.S. Cl. 73—36 **8 Claims**



Apparatus provides for an on-line determination of the flash point of lube oil fractions. The hydrocarbon is continuously sampled by a viscosity analyzer and a density analyzer which provides signals corresponding to the viscosity and the API gravity of the lube oil fractions. A computer circuit provides a signal corresponding to the flash point of the lube oil fractions in accordance with the viscosity signal and the gravity signal.

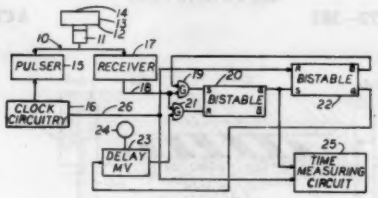
3,748,895

PULSE ULTRASOUND THICKNESS MEASURING SYSTEM HAVING INTERROGATION CONTROL

Jr. Kummer, Mount Prospect, Ill., and Ronald A. Straw, Brookfield, Conn., assignors to Magnaflux Corporation, Chicago, Ill.

Filed June 1, 1971, Ser. No. 148,427
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 **9 Claims**

Pulse ultrasound thickness measuring system including a bistable circuit triggered to a set condition by an interface signal and to a reset condition by a back reflection received signal, the duration of the set condition of the bistable circuit being measured. The back reflection received signals are applied through gate mean controlled by a variable delay circuit in a manner to perform an interrogation function and to determine the order of the received signal which trigger the bistable



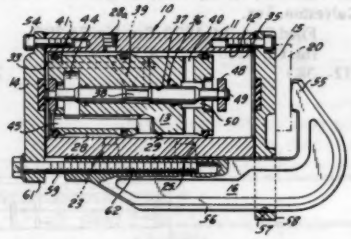
circuit, to reliably and accurately determine the thickness a part. The variable delay mean may be operated manually or may be operated automatically and in conjunction with memory and subtraction means, to obtain an automatic readout of the thickness.

3,748,896

VIBRATOR UNIT FOR TESTING A MOTOR VEHICLE FOR RATTLES AND SQUEAKS

Robert E. Barrows, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Jan. 20, 1972, Ser. No. 219,418
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 **4 Claims**



A vibrator unit for detecting rattles and squeaks in selected parts of a motor vehicle; the detector having a cylinder in which a piston is pneumatically reciprocable to develop vibrations in the cylinder. An adjustable clamp is mounted upon the cylinder for detachably clamping the cylinder to a selected part of a motor vehicle so as to transmit the vibrations of the cylinder to the part and general area. A live air supply hose line having a pressure regulator therein is connected to an inlet of the cylinder; the regulator being manually operable to selectively vary the pressure of operating air flow to the cylinder and as a consequence varying the operating frequency of the piston; and the hose line being lengthy so as to permit operation of the regulator at distances remote from the cylinder. A noise muffler is connected by a hose line to an exhaust port of the cylinder to obtain a quiet environment for better discerning sounds of rattles and squeaks.

3,748,897

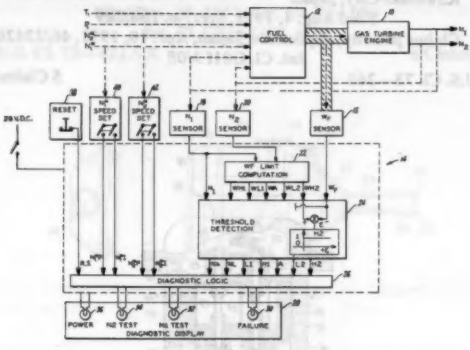
FUEL CONTROL DIAGNOSTIC UNIT

Charles M. Rabinowitz, Bloomfield, Conn., assignor to Chandler Evans Inc., Hartford, Conn.

Filed Dec. 13, 1971, Ser. No. 206,998
Int. Cl. G01m *15/00*
U.S. Cl. 73—118 **13 Claims**

The quality of performance of an engine fuel control is measured by comparing actual fuel flow with computed limits of acceptable fuel flow. The comparison is made only for opera-

tional modes corresponding to the most probable departures from acceptable performance. Apparatus in accordance with the invention employs digital logic and is responsive to signals



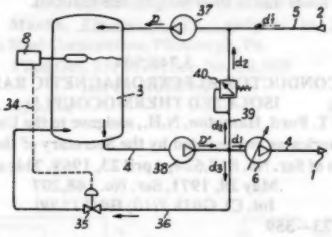
commensurate with the controlling input parameters to the control and to a signal commensurate with actual flow rate provided by the control.

3,748,898

METHOD AND APPARATUS RELATED TO THE TESTING OF HYDRAULIC CIRCUITS

Olivier Andre Henry Louis Hellouin de Menibus, Etampes, France, assignor to Societe D'Appareillages Et Materiels De Servitudes A.M.S., Choisy-Le-Roi, France

Filed Nov. 4, 1971, Ser. No. 195,603
Int. Cl. G01m *19/00*
U.S. Cl. 73—168 **8 Claims**



For performing tests on a hydraulic circuit, to the latter there is coupled an auxiliary hydraulic circuit which is associated with a testing stand and which comprises a high-pressure pump of variable output as well as a liquid tank of substantial volume. The rate of liquid flow into and out of said tank is maintained very accurately balanced by a first, continuously operating means effecting a coarse balancing and a second, intermittently operating means effecting a fine balancing. The said second means is actuated when the amplitude of variation in the volume of the liquid contained in said tank exceeds that resulting normally from the temperature changes of the liquid in the entire auxiliary circuit.

3,748,899

CONDUCTIVITY AND TEMPERATURE SENSING PROBE

Michael C. Gregg, La Jolla, and Charles S. Cox, Del Mar, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 12, 1972, Ser. No. 261,766
Int. Cl. G01d *1/16*
U.S. Cl. 73—170 A **6 Claims**

A probe-like casing is provided interiorly with a chamber having a small orifice permitting ocean water to flow into the chamber reservoir. Conductivity is sensed by separate pairs of electrodes mounted interiorly and exteriorly of the chamber. One of these pairs, the driving electrodes, apply a constant amplitude square wave electrical current across the opening while the other pair of electrodes, the sensing electrodes, measure voltage variations across the opening produced by variations in the electrical conductivity of the ocean water in the opening. Suitable means are mounted in the casing to exert a positive suction force capable of continuously drawing the ocean water at a controlled flow rate through the opening. The probe falls freely through the ocean to constantly draw in

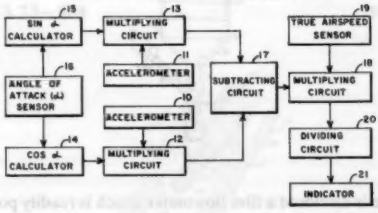
ocean water. The voltage variations sensed by the sensing electrodes are directly related to variations in the electrical resistance of the water drawn into the hole. Since variations in electrical resistance are due both to variations in temperature and electrolyte concentration, a thermistor is mounted near the orifice or opening into the chamber so as to constantly sense temperature variations present in the same volume of water that is producing the electrical resistance variations. These simultaneous measurements determine the variation in electrolyte concentration.

3,748,900

RATE OF CHANGE OF ENERGY INDICATOR

Olva Herbert Lindquist, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1971, Ser. No. 195,744
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 R **6 Claims**



Apparatus for providing a pilot of an airplane with an indication of the rate of change of specific energy of the airplane.

3,748,901

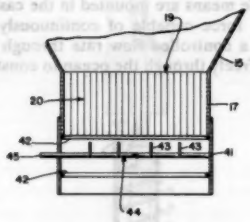
AIR FLOW BALANCING DEVICE

Kenneth W. DeBaun, Novato, Calif., assignor to Air Monitor Corporation, Santa Rosa, Calif.

Filed Mar. 31, 1971, Ser. No. 129,769
Int. Cl. G01p *5/16*
U.S. Cl. 73—212 **4 Claims**

An improved air balancing hood collects air discharged to atmosphere from air diffusers, grilles, etc., as those used in typical heating, ventilation and air-conditioning systems, in

a convergent collection chamber which terminates in an air-straightening neck of known cross-section to eliminate turbulence and thereby achieve substantially laminar air flow for



delivery to flow measuring instrumentation. The volume of air passing through the diffuser is directly measured by total pressure measuring means assembled to the hood and calibrated in flow rate units.

3,748,902

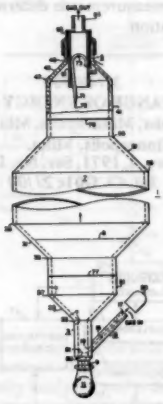
GAS FLOW METER

Lloyd V. Guild, Bethel Park, Pa., assignor to Scientific Kit Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 82,687, Oct. 21, 1970. This application Apr. 14, 1972, Ser. No. 244,314

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 R **4 Claims**



There is disclosed a film flowmeter which is readily portable for field work and which is capable of measuring gas flow of as high as 100 or even 10,000 liters per minute. The meter includes a tube attenuated at the ends with a side-arm for entrance of the gas at one end; the other end being open for exit of the gas. The opening of the side-arm into the tube has an abrupt or sharp boundary to effectuate formation of the film. To accommodate the large-volume flow, the intermediate portion of the tube has a large diameter. To prevent rupture of the film, the attenuated ends taper into the intermediate portions with straight-shoulder surfaces at an internal angle *a* of no more than about 220° at the attenuated end and an internal angle *b* of at least about 130° at the intermediate portion. The tube is provided with a reentrant insert for puncturing the film at the exit end and to prevent ejection or carry-over of film solution at the outlet end.

3,748,903

FLOW METER HAVING VERTICAL ROTOR SHAFTS

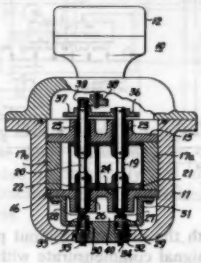
Yoshihiko Irie, Kawasaki; Mahiko Kato, Tokyo, and Kiyondo Gomi, Yokohama, all of Japan, assignors to Tokico Ltd., Kawasaki-City, Japan

Filed Aug. 4, 1971, Ser. No. 168,829

Claims priority, application Japan, Apr. 10, 1971, 46/22420

Int. Cl. G01f *3/08*

U.S. Cl. 73—261 **5 Claims**



A flow meter has vertically disposed rotor shafts which rotate integrally with rotors responsive to the flow quantity of a fluid. The shafts are supported, on one hand, by thrust bearings which pivotally receive vertical shaft loads due to the weights of the rotors and shafts and supported, on the other hand, by radial bearings which receive transverse shaft loads due to the rotation of the rotors and the shafts caused by the differential pressure of the fluid. The rotors and the shafts receive an upwardly acting force due to the differential pressure between inlet and outlet passages, and whereby the vertical shaft loads due to their weights are reduced.

3,748,904

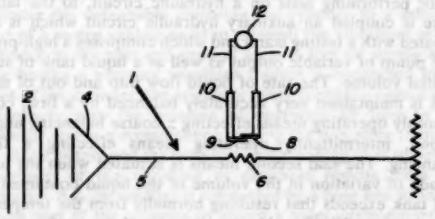
SEMICONDUCTOR ELECTROMAGNETIC RADIATION ISOLATED THERMOCOUPLE

Richard T. Ford, Hampton, N.H., assignor to the United States of America as represented by the Secretary of the Navy

Division of Ser. No. 818,624, April 23, 1969. This application May 28, 1971, Ser. No. 148,207

Int. Cl. G01k *7/10*; H01l *15/00*

U.S. Cl. 73—359 **2 Claims**

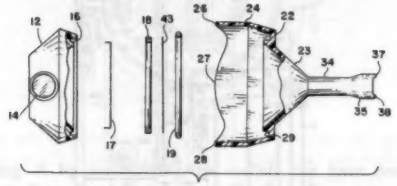


To measure temperature in an electromagnetic field a thermocouple is connected to a meter. The temperature to be measured is sensed and converted into a D.C. voltage by the thermocouple. This D.C. voltage causes the meter to indicate the temperature. To prevent error due to electromagnetically coupled energy heating the thermocouple and/or producing a high frequency current which is conducted to the meter circuit from interfering with the meter readings, a physically small thermocouple with semiconductor leads or a semiconductor thermocouple having semiconductor leads is provided.

3,748,905
VACUUM PROBE SURFACE SAMPLER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Bruce A. Zahlava, Cary, N.C.

Filed Dec. 30, 1971, Ser. No. 214,086
Int. Cl. G01n *1/00, 1/24*
U.S. Cl. 73—421.5 R 6 Claims

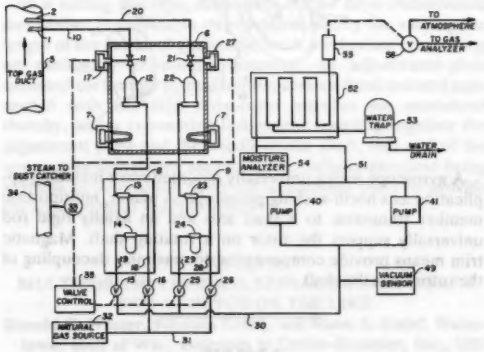


A vacuum probe surface sampler for rapidly sampling relatively large surface areas which possess relatively light loading densities of micro-organisms, drug particles or the like. A vacuum head having a hollow handle connected to a suitable vacuum source is frictionally attached to a cone assembly terminating in a flared tip adapted to be passed over the surface to be sampled. A fine mesh screen carried by the vacuum head provides support for a membrane filter which collects the microorganisms or other particles with the head assembly being easily removed from the cone assembly without contacting the cone assembly with human hands.

3,748,906
GAS SAMPLING APPARATUS

Dan Paul Manka, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1970, Ser. No. 80,989
Int. Cl. G01h *1/24*
U.S. Cl. 73—421.5 A 4 Claims

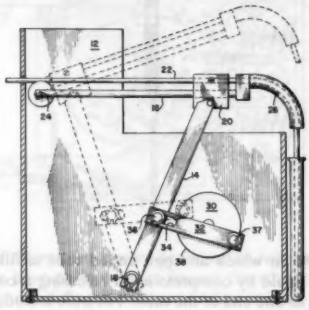


Gas-sampling apparatus for sampling a dirt- and moisture-laden gas stream, such as blast-furnace top gas, cleaning the gas and delivering it to a gas analyzer employs parallel sampling probes and associated filter units to permit continuous alternate sampling and cleaning of the filters by back-flushing. The apparatus automatically ceases sampling whenever a foreign gas is introduced into the gas stream being sampled.

3,748,907
FLUID SAMPLING DEVICE

Otto H. Sahmel, Rochester, N.Y., assignor to Bausch & Lamb Incorporated, Rochester, N.Y.

Filed June 7, 1971, Ser. No. 150,320
Int. Cl. G01n *1/14*
U.S. Cl. 73—423 A 4 Claims

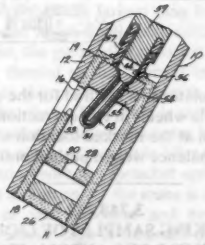


In automatic analysis apparatus having a feed mechanism which periodically presents a test tube at a fixed station to have its contents drawn into the apparatus for analysis, a rotating crank drives a pivoting arm in an arcuate path, the arm being connected to a flexible probe which thereby is alternately pushed into and withdrawn from each succeeding test tube. A guide member may be supplied on a second pivoting arm to assist the probe's entry into the test tube. The interface between crank and arm may be provided with any of a variety of dwell cams to adjust the time during which the probe is in the test tube for withdrawal of the sample, or to adjust the time during which the probe is above the test tube station for movement of the tube conveyor or for cleaning of the probe.

3,748,908
DEVICE FOR TAKING A MOLTEN SAMPLE

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis.

Division of Ser. No. 676,005, Oct. 2, 1967, Pat. No. 3,401,201, which is a continuation-in-part of Ser. No. 589,296, Oct. 25, 1966, abandoned. This application Jan. 17, 1969, Ser. No. 811,682
Int. Cl. G01n *25/04*; G01k *1/14*
U.S. Cl. 73—354 9 Claims



A sampling lance for molten metal comprising a refractory cartridge with side, top and bottom walls and with a side entry port is mounted in an insulating cardboard sleeve and is utilized for obtaining a sample directly from any source of molten metal such as a bath, ladle or ingot. The cartridges are provided with thermo-couples for measuring bath temperatures and cooling curves of the samples simultaneously with taking the sample.

3,748,909

PIPPETTE

Mau H. Kuo, 19 Shearer Dr., Atherton, Calif.

Filed Mar. 10, 1971, Ser. No. 122,872
Int. Cl. G01n *1/14*; B01l *3/02*
U.S. Cl. 73—425.4 P 11 Claims

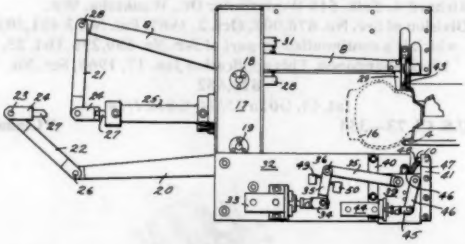
A pippette in which an open ended tube is filled with or emptied of liquid by compressing or releasing a compressible bulb sealed to one end of the tube. The bulb includes a restrictor that diminishes the air flow into and out of the bulb to limit the maximum rate at which the liquid can be flowed into and out of the tube substantially irrespective of the pressure applied to the bulb. The filter is so mounted that it is not contacted by the fluid in the tube.

3,748,910

METHOD AND APPARATUS FOR AUTOMATIC BALANCING OF MOTOR VEHICLE WHEELS

Dionys Hofmann, Darmstadt-Marienhoho, Hessen, Germany, assignor to Diouys Hofmann GmbH Maschinenfabrick, Onsttmettingen (Wurtt), Germany

Division of Ser. No. 864,941, Sept. 23, 1969, Pat. No. 3,623,208, which is a continuation-in-part of Ser. No. 800,882, Feb. 20, 1969, abandoned. This application June 9, 1971, Ser. No. 151,584
Int. Cl. G01m *1/38*
U.S. Cl. 73—468 4 Claims



The invention relates to a method for the automatic balancing of motor vehicle wheels in two correction planes where the tire bead is broken at the marked location of unbalance and a holding clip for a balance weight pushed onto the rim flange.

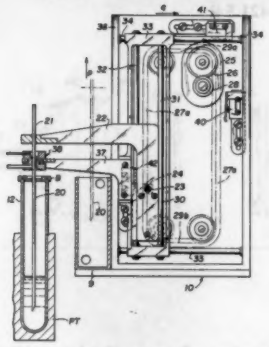
3,748,911

DEVICE FOR TAKING SAMPLES OF LIQUID SPECIMENS ESPECIALLY FOR THE AUTOMATIC ANALYSIS APPARATUS

Andre Rousselet, Eaubonne, and Pierre Durand, Fresnes, both of France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 29, 1971, Ser. No. 213,526
Claims priority, application France, Dec. 29, 1970, 7047006
Int. Cl. G01r *1/16*
U.S. Cl. 73—423 A 6 Claims

A device for taking samples of liquid specimens, such as blood, microbiological suspension and the like for use with an automatic analysis apparatus. The device comprises a sampling head including a hollow needle connected to a pump at one end. The needle is fixed to a support mounted for movement with an endless belt with horizontal and vertical sides in two perpendicular directions. Means are provided for washing the exterior of the needle and are mounted for movement with



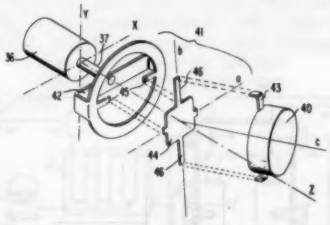
the needle in one of the perpendicular directions; they comprise a block with bores, one of the bores being connected to a tube carrying a washing liquid thereto and another of the bores being connected to a tube carrying the washing liquid away therefrom. Optical or electrical means may be provided for positioning the needle relative to a test tube containing the liquid to be analysed.

3,748,912

GYROSCOPE WITH UNIVERSALLY MOUNTED ROTOR

George L. Hildebrand, Marblehead, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed July 17, 1968, Ser. No. 745,494
Int. Cl. G01c *19/16*
U.S. Cl. 74—5 F 17 Claims



A gyroscope with a universally mounted rotor including application as a north-seeking gyroscope. A planar, multiportion member transverse to a shaft axis and an axially rigid rod universally support the rotor on a rotating shaft. Magnetic trim means provide compensation to maximize decoupling of the rotor from the shaft

---

3,748,913

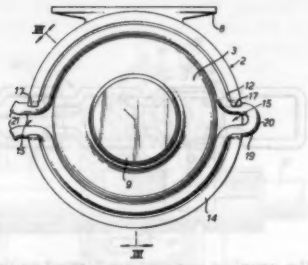
VEHICLE BRAKE ACTUATORS

Kenneth Maurice Quiney, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Filed June 16, 1971, Ser. No. 153,670
Claims priority, application Great Britain, July 3, 1970, 32,322/70
Int. Cl. F16j *15/56*
U.S. Cl. 74—18.2 4 Claims

A dust excluding seal for an automotive brake actuator has an out-turned flange. Such a seal can be fitted to engage not

the outside surface of the actuator housing but a surface preferably in a radial plane within the outside diameter of the



housing. A lip surrounding the surface can have dove-tail recesses for a clip clamping the seal to the surface.

3,748,914

TUFTING MACHINES

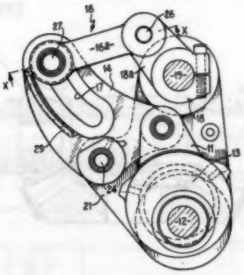
Ronald Parsons, Blackburn, Lanchashire, England, assignor to The Singer Company (U.K.) Limited, London, England

Filed Aug. 12, 1971, Ser. No. 171,234

Claims priority, application Great Britain, Aug. 22, 1970, 40,559/70

Int. Cl. F16h *21/18*

U.S. Cl. 74—42 **5 Claims**



In a tufting machine, the needle-stroke drive-transmission mechanism is adjustable to provide a facility for varying the length of the stroke of the needle, such mechanism comprising an oscillating drive-input member, an adjustmemt-plate mounted for limited pivotal motion about a fixed axis and connected with the said drive-input member for movement thereby, and a connecting-link means coupling together the adjustment plate and the needle-stroke shaft, that end of the connecting-link means secured to the adjustment-plate being variable as to position upon the adjustment plate to provide the adjustment in needle stroke.

3,748,915

MULTIPOSITION BI-DIRECTIONAL ROTARY MEANS FOR A SWITCH OR THE LIKE

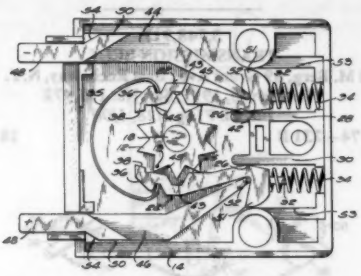
Ronald C. Winter, Johnson Creek, and Enno A. Knief, Watertown, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 24, 1972, Ser. No. 228,895

Int. Cl. F16h *27/02*

U.S. Cl. 74—128 **2 Claims**

Multiposition bi-directional rotary means for a switch or the like includes a rotary ratchet operated by two actuating push levers. Two advance levers or pawls are slidably and pivotally mounted and engage this ratchet from opposite radial directions. Each advance lever has means for engaging the ratchet to rotate the ratchet one step to an adjacent position and means to engage the ratchet and releasably hold it in a position. One lever rotates it in one direction the other lever rotates it the opposite direction. A single spring engages both advance levers to urge them radially inward toward the ratchet. Other springs urge the advance levers or pawls tan-



gentially of the ratchet toward projected at-rest positions. The push levers have projections to engage the advance levers for effecting lineal sliding movement and permitting pivoting of such advance levers relative to the ratchet and the push levers.

3,748,916

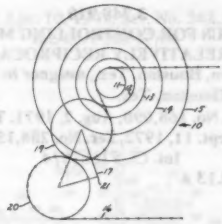
CHAIN SHIFTING MEANS FOR DERAILLEUR SPEED CHANGING DEVICES

Milton Morse, 1 Horizon Rd., Fort Lee, N.J.

Filed June 3, 1971, Ser. No. 149,537

Int. Cl. F16h *9/24*

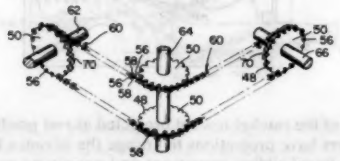
U.S. Cl. 74—217 B **10 Claims**



An improved derailleur mechanism for use with bicycles having a choice of five speeds in increments such that the torque ratio varies approximately 1.5 to 1 with each increment. The smallest driven sprocket on the rear wheel hub has only nine teeth, so that the largest may have only 45 teeth. During the period in which the 9 tooth sprocket is engaged by the sprocket chain, the guide idler sprocket is positioned close to the periphery thereof so that there is insufficient room to permit the chain to skip over the teeth with the transmission of power through the chain. The chain is shifted from a smaller sprocket to a sprocket of larger diameter by a "pinch" effect in which the pitch circle of the guide idler sprocket is pressed in tangential relation with the sprocket upon which the chain is shifted, so that a segment of the same is constrained to ride over the teeth of said sprocket and be quickly engaged thereon. The derailleur cage is mounted on the bicycle at an empirically determined pivot point such that the pitch circle of the guide idler sprocket will always enter into selective tengential relation with each of the five driven sprockets. In embodiments employing sprockets of irregular progression, it is possible to modify the path of the guide idler sprocket by varying the location and length of the trunnions which support the cage. Under certain conditions, a trunnion length of 0.9 inches will provide sufficient radial displacement for a progression of 13 to 24 teeth to obtain a torque ratio of almost 2 to 1. A chain jack is provided on the frame of the bicycle to disengage the driven chain from the sprockets for easy removal of the rear

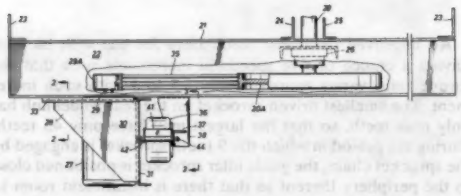
wheel. This jack may also be used to determine the amount of length of chain on initial installation. The derailleur is also provided with a transverse axis rocking adjustment to compensate for slight discrepancies in the length of the driven chain.

3,748,917
TRANSMISSION BELT
Winfred M. Berg, 89 Grant Ave., East Rockaway, N.Y.
Filed Nov. 5, 1971, Ser. No. 195,972
Int. Cl. F16g *1/28, 1/00*
U.S. Cl. 74—231 R **18 Claims**



A transmission belt for use with sprockets and gears featuring an elongated body portion comprising: at least one elongated flexible body element in the form of a cable or the like, with a soft plastic jacket or covering, and a series of transmission pins made of hard plastic, being generally perpendicular to the cable and molded over the soft plastic covering, in which the diameter of the pins is greater than the outside diameter of the cable.

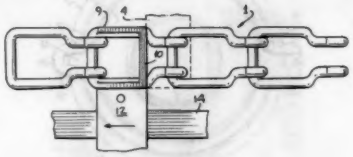
3,748,918
APPARATUS FOR CONTROLLING MOVEMENT BETWEEN RELATIVELY RECIPROCABLE BODIES
Glenn H. Johnson, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.
Division of Ser. No. 168,090, Aug. 2, 1971. This application Sept. 11, 1972, Ser. No. 288,155
Int. Cl. F16h *7/14*
U.S. Cl. 74—242.13 A **1 Claim**



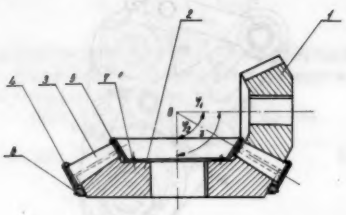
A pair of shafts having a flexible belt disposed about pulleys thereon are mounted for relative reciprocation, a fluid actuator is connected between shaft mountings to urge them apart and thereby maintain tension in the belt, and a means is provided for normally preventing movement of the shafts toward one another in the event the fluid supply to the actuator should fail.

3,748,919
SANITARY CHAIN
Charles H. Cook, and Dwight H. Bergquist, both of Springfield, Mo., assignors to Henningsen Foods, Inc., White Plains, N.Y.
Filed Jan. 19, 1972, Ser. No. 219,062
Int. Cl. F16g *13/02*
U.S. Cl. 74—249 **9 Claims**

A drive chain which is particularly useful with food processing or similar machinery where the chain must be periodically cleaned or sanitized. The chain is formed of metal links which are releasably coupled together to form an endless drive chain suitable for sprocket drive. The chain links, including the coupling portions are formed so that the assembled chain has its surface fully exposed for cleaning as, for example, by a water spray.



3,748,920
GEAR-TOOTH ARRANGEMENT AND TRANSMISSION INCORPORATING SAME
Yordan Gueorguiev Lambev, Sofia, Bulgaria, assignor to DSO Cherna Metalurgia I Rudobiv, Sofia, Bulgaria
Filed May 24, 1971, Ser. No. 146,410
Claims priority, application Bulgaria, May 28, 1970, 14803
Int. Cl. F16h *55/06, 1/20*
U.S. Cl. 74—465 **2 Claims**

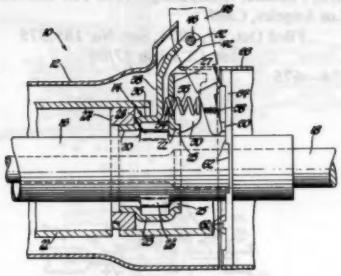


A bevel-gear or spur-gear transmission arrangement whose two wheels have beds corresponding to conic and cylinder segments, respectively, along their periphery and receive conical and cylindrical roller bodies. The cylindrical roller bodies form part of a chain while the conical roller bodies have apices lying at the intersection point of the shafts of the two wheels.

3,748,921
TRANSMISSION SHIFT CONTROL
Robert C. Farrell; John W. Skelley, both of Saginaw; Thomas J. Milton, Bay City, and Henry I. Piziks, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 1, 1971, Ser. No. 194,173
Int. Cl. G05g *9/12*
U.S. Cl. 74—484 **7 Claims**

The steering column-mounted shift mechanism shown includes a rotatable stamped shroud secured to a stamped gearshift and detent plate bracket which, in turn, is operatively connected to the usual shift or control tube. The bracket is formed from a flat blank to include a pair of spaced end rings with an interconnecting strap member and having a support for the pivotal mounting of a shift lever formed on a side of one of the end rings and a bracket with a pair of arcuate mounting flanges formed on a side of the other end ring in a spaced parallel relationship. The arcuate flanges are secured to an inner surface of the shroud and one of the flanges includes notches suitable for cooperation with a sliding rack of the usual steering column lock system. A shift leber biasing

spring is mounted through an opening in the bracket and retained at one end against the shift lever pivotal mounting



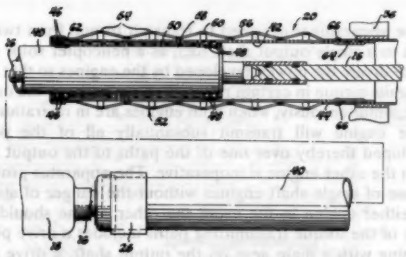
support. This arrangement is adaptable for use with either an automatic or a synchromesh transmission.

3,748,922

ENERGY ABSORBING STEERING COLUMN

Robert C. Farrell, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 16, 1972, Ser. No. 253,788
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **3 Claims**



A dual stage energy absorbing steering column includes a support jacket unit comprised of three concentrically arranged jacket members, the inner and intermediate ones of which include a deformer ball type of energy absorber responsive to a first level of impact force on the jacket unit to collapse and absorb energy, the outer jacket member including an energy absorbing plastically deformable section generally coextensive the length of the intermediate jacket member and crushable under some other level of impact force to absorb energy, releasable shear pins engaged between such outer and intermediate jacket members and of a strength selected to effect a desired order of occurrence of energy absorption as between the two energy absorbers.

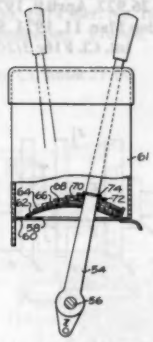
3,748,923

ENVIRONMENTAL SEAL FOR A TRANSMISSION SHIFT LEVER

John H. Babbitt, Jr., Peoria, and William A. Young, Jr., East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 11, 1971, Ser. No. 170,781
Int. Cl. F16j *9/00*; E21b *33/00*
U.S. Cl. 74—566 **7 Claims**

A seal assembly for sealing an opening about a control element which passes through a wall. The seal comprises a plurality of plates slidably stacked in an overlapping manner about the control element to cover the opening around the



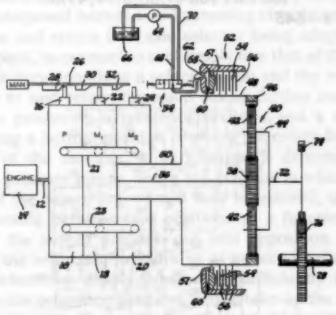
lever and to permit movement of the control element throughout its control range.

3,748,924

HYDROSTATIC TRANSMISSION AND METHOD OF TRANSMITTING POWER THERETHROUGH

Norman A. Cross, and James C. Polak, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 10, 1972, Ser. No. 242,309
Int. Cl. F16h *47/04*
U.S. Cl. 74—677 **6 Claims**



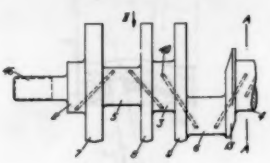
A hydrostatic transmission having a variable displacement hydraulic pump in fluid communication with a pair of variable displacement hydraulic motors. The output shafts of the hydraulic motors are drivingly connected respectively to two members of a simple planetary gear set, the third member of which gear set is drivingly connected to the transmission output. One motor shaft and the planetary gear member connected thereto are operatively connected to a brake which is selectively operable to prevent rotation thereof. The brake is engaged in a low speed range to provide a gear reduction between the other motor output shaft and the transmission output through the planetary gear set. The brake is disengaged during a high speed range so that the one motor provides a rotating reaction for the planetary gear set and contributes a speed component to the planetary gear set.

3,748,925

CRANKSHAFT BALANCE WEIGHTS AND METHOD OF ASSEMBLY

William F. Stewart, Peterborough, England, assignor to Perkins Engines Limited, Peterborough, England

Division of Ser. No. 26,922, April 9, 1970, Pat. No. 3,673,651.
This application Mar. 11, 1971, Ser. No. 123,461
Int. Cl. F16c *3/20*
U.S. Cl. 74—603 1 Claim



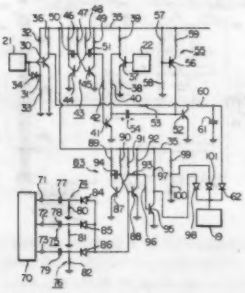
A crankshaft is formed with stub web portions for attachment of balance weights. The crankshaft bearing surfaces are ground and then the weights are electron beam welded to the web portions, which have a stepped configuration to enable indexing for sequential weight welding. After hardening trimmer plates are fastened to the weights axially of the crankshaft to complete the balancing. This provides an inexpensive, easily machined, accurately balanced crankshaft.

3,748,926

LINE PRESSURE CONTROL SYSTEM FOR AUTOMATIC POWER TRANSMISSION

Yohichi Mohri, Yokohama, and Masayuki Ishizaki, Hitachi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama-City and Hitachi Limited, Tokyo, Japan

Filed Dec. 16, 1970, Ser. No. 98,797
Claims priority, application Japan, Dec. 22, 1969, 44/102490
Int. Cl. F16h *47/00, 3/74, 47/00*
U.S. Cl. 74—645 3 Claims



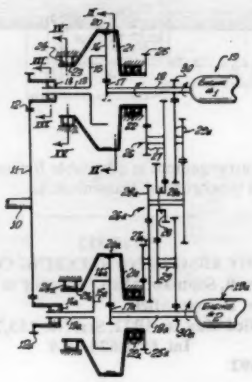
A line pressure control system for an automatic power transmission capable of maintaining a line pressure at proper levels in response to the engine output torque and the torque convertor turbine speed during gear shift operation. When gear shifting is to be effected, a gear shift indicating signal is applied to a command which allows a signal corresponding to the proper line pressure to be applied to a line pressure regulating means. During a time interval starting at the occurrence of the gear shift operation, the proper line pressure depending upon the output torque and turbine speed is applied to the transmission and upon termination of the time interval a higher line pressure is applied thereto.

3,748,927

MULTI-ENGINE TO SINGLE SHAFT TORQUE TRANSMISSION

Heber T. Hertzog, Palos Verdes Peninsula, Calif., and Peter Kamstra, Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 15, 1971, Ser. No. 189,575
Int. Cl. F16h *37/08*
U.S. Cl. 74—675 17 Claims



The apparatus is designed to transmit torque from two engines to a single output shaft such as a helicopter rotor shaft and to divide the power developed by the engines so that each transmits torque in certain ratios over two paths to the output shaft, simultaneously, when both engines are in operation and either engine will transmit subsantially all of the power developed thereby over one of the paths to the output shaft when the other engine is inoperative. The apparatus provides for use of single shaft engines without the danger of stalling out either engine in the event the other engine should fail. Each of the torque transmitting paths includes a drive pinion meshing with a main gear on the output shaft, a drive shaft connected with its respective drive pinion by a one-way clutch, a planetary gear system having a carrier connected with the drive shaft, planet gears on the carrier meshing with a ring gear restricted to rotation in one direction only, and a gear train with a series of gears extending between the ring gear of the planetary gear system and the engine shaft.

3,748,928

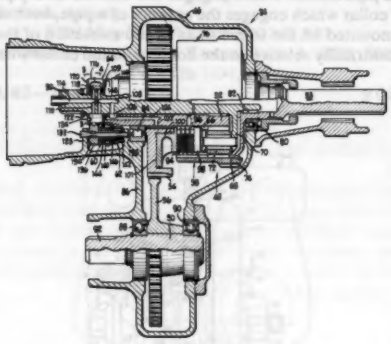
CONTROL SYSTEM FOR MUTIPLE DRIVING AXLE VEHICLE

Samuel Shiber, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 181,928
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 22 Claims

In multiple driving axle vehicles, such as four wheel drive automotive vehicles, drive is transmitted to front and rear differentials respectively drivingly connected to front and rear pairs of road wheels, a controlled third or center differential drivingly connected to the front and rear differentials and acting as a free differential until one output of this differential rotates slower or faster a predetermined amount than the other output, at which time the control acts to operate a

clutch to lock the center differential preventing any further increase in speed differences. The control is sensitive to the



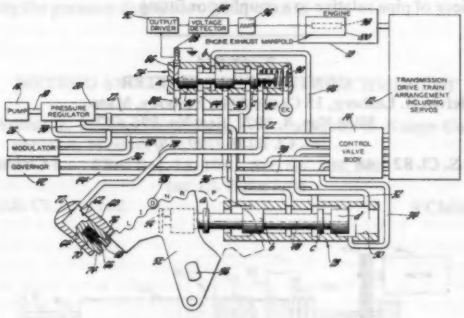
speed differences, percentagewise, of the outputs of the front and rear differentials, and acts to bias torque in the third differential according to the derivative of their speeds.

3,748,929

VARIABLE POWER TRAIN AND CONTROL

Lawrence E. Green, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 17, 1971, Ser. No. 143,805
Int. Cl. B60k 27/08
U.S. Cl. 74—844 **4 Claims**



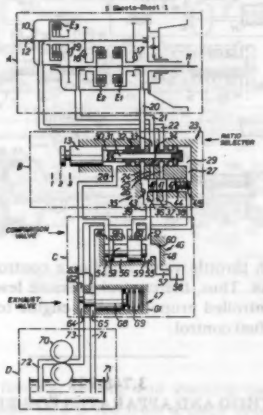
A power train and control therefor including an engine driven transmission selectively shiftable to a plurality of forward drive positions and a reverse drive position and a neutral drive position. The transmission control includes a manual shift valve which directs fluid pressure from an engine driven pump to the transmission friction drive engaging devices. This manual control valve is movable to a plurality of drive conditions including a neutral condition. A heat sensor is placed in the engine exhaust manifold to determine the temperature of the exhaust gas from the engine. When the engine stalls, the exhaust gas temperature will decrease rapidly which decrease in temperature is detected electronically to control a shift lock control valve which directs fluid pressure from the pump to a locking member located adjacent the manual shift valve which will prevent shifting of the manual valve from the drive or reverse to the neutral position. The shift lock control also directs fluid pressure from the transmission governor to the transmission control to assist in automatic shifting. When the engine is stalled the governor pressure directed to the shift lock control is blocked and replaced with line pressure to prevent automatic shift changes from occurring in the transmission.

3,748,930

HYDRAULIC SYSTEM FOR CONTROLLING THE CHANGING OF GEAR RATIOS IN AUTOMOTIVE VEHICLE TRANSMISSIONS

Pierre Andre Georges Lepelletier, Paris, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France

Filed July 30, 1971, Ser. No. 167,638
Claims priority, application France, Aug. 10, 1970, 7029387
Int. Cl. B60k 21/00
U.S. Cl. 74—864 **17 Claims**



A device for controlling the process of changing gear ratios in a transmission system, especially for automobile vehicles, in which each said gear ratio is associated with a hydraulic actuating chamber and is brought into action by communication of said chamber with a supply line connected to a source of pressure, and out of action by communication of said chamber with the return line to a tank, said device comprising a ratio selector interposed between said actuating chambers and said supply line and return line, said selector being adapted, at a definite speed, to connect to said supply line that of the chambers which corresponds to a selected ratio and the remaining chambers to said return line, said device further comprising means for producing a reference pressure and a reversing valve having a bottom position in which the return line of the chamber of the member to be changed is diverted to the reference pressure means, and a top position in which a connection of the return line to said tank is restored, said valve being movable between said positions as a function of the values of the supply pressure put into opposition with the values of the reference pressure so as to take-up the bottom position when the supply pressure is sufficiently low with respect to the reference pressure, and to take-up the top position when the supply pressure is sufficiently high with respect to the reference pressure, said selector being further adapted, during the course of changes of ratio, to connect the reference pressure to the actuating chamber corresponding to the ratio being changed.

3,748,931

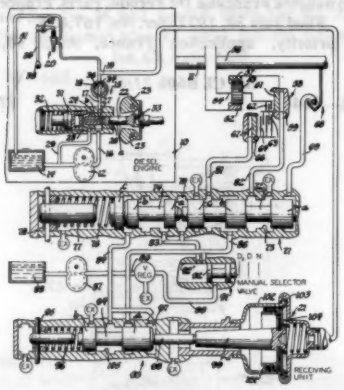
POWER TRAIN AND CONTROL SYSTEM

Robert H. Schaefer, Westfield, and Jerry R. Marlow, Greenwood, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1971, Ser. No. 129,033
Int. Cl. B60k 21/02
U.S. Cl. 74—867 **3 Claims**

A fuel control system for use with a compression ignition engine driven transmission. Fuel pressure modified by a regulating valve responsive to an engine operating parameter is

supplied to a diaphragm type motor mounted on the transmission. The output of the motor varies in response to the fuel feed position of the engine fuel control to provide a variable force torque demand signal which is imposed on the throttle



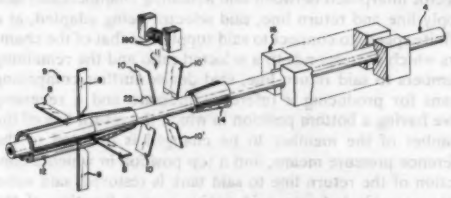
valve which throttle valve supplies a control pressure in the transmission. Thus, the control pressure level of the throttle valve is controlled proportional to engine torque demand by the engine fuel control.

3,748,932

METHOD AND APPARATUS FOR REMOVING INSULATION FROM WIRES INTERMEDIATE THE ENDS THEREOF

Richard Alvin Neiman, Harrisburg, and Glendon Henry Schwalm, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 9, 1972, Ser. No. 224,851
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 **9 Claims**



Apparatus for removing insulation from wires intermediate the wire ends comprises insulation slitting knives which axially slit in the area from which insulation is to be removed and insulation cutting and removing blades spaced from the slitting knives. The insulation cutting and stripping blades are movable towards each other and into engagement with the wire to form circumferential cuts in the insulation at each end of the previously formed slits. Thereafter, the two pairs of insulation cutting and removing blades move toward each other along the wire axis to compress and arch the segments of insulation and separate them from the metallic core of the wire.

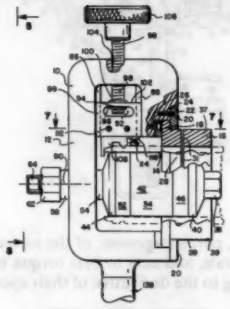
3,748,933

PIPE CUTTING AND FORMING TOOL

James C. De Shazor, 3314 Coy Dr., Sherman Oaks, Calif.

Filed Feb. 24, 1972, Ser. No. 229,112
Int. Cl. B23b *3/22, 3/04*
U.S. Cl. 82—4 C **17 Claims**

A pipe cutting and forming tool particularly adapted for manual use in cutting and forming the ends of plastic pipe to receive seals and coupling structures for coupling plastic pipe to connectors or fittings and for sealing the pipe relative to such connectors or fittings; the tool comprising a frame carrying a pipe holder which engages the interior of a pipe and a pipe collar which engages the exterior of a pipe, both of which are mounted on the frame so as to allow rotation of the frame concentrically relative to the holder and the collar when fixed



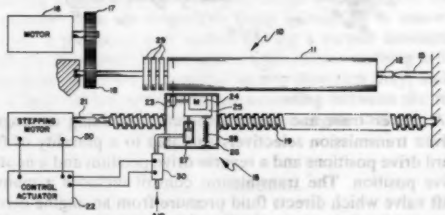
to the pipe; and a cutter and forming tool adjustably mounted on the frame to move radially inward and outward relative to an end of the pipe when held by the pipe holder and collar so that shoulders and seal engaging portions as well as grooves may be formed on the exterior of the pipe at the end for holding seals as well as locking means for sealing and locking a piece of pipe relative to a coupling or fitting.

3,748,934

CONTROL FOR A SLITTER

Melvin G. Lezberg, 15 Crane Ave., Peabody, Mass.

Filed Nov. 8, 1971, Ser. No. 196,427
Int. Cl. B23b *7/00, 3/04*
U.S. Cl. 82—48 **5 Claims**



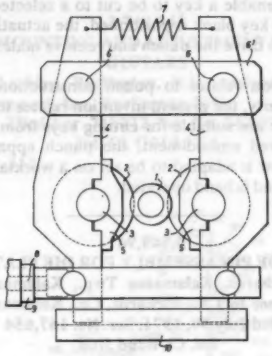
The invention relates to a control means for a slitter which cuts an elongated member into slices of predetermined lengths. The control means comprises a stepping motor and a control actuator. The stepping motor is responsive to applied pulses of electrical power and functions to rotate its output shaft a discrete and precise amount for each pulse received. The control actuator couples, a preselected number of pulses to the stepping motor. The output shaft is coupled to a cutting means and controls the movement and positioning of the cutting means. The parameters of these components are correlated so that the number of pulses equals the movement of the cutting means and the length sliced from the elongated member.

3,748,935

TUBE CUTTING DEVICES, NOTABLY FOR AUTOMATIC LATHES

Jean Beauchet, Annecy, France, assignor to Societe Norwelle de Roulements, Annecy, France

Filed May 28, 1971, Ser. No. 147,841
Claims priority, application France, June 4, 1970, 7020481
Int. Cl. B23b 3/04, 5/14
U.S. Cl. 82—70.1 R 9 Claims



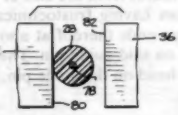
Device for cutting tubular pieces by means of cutting-wheels, characterized in that two cutting-wheels are disposed symmetrically on either side of the piece to be cut, a pair of lever arms each supporting one of said cutting-wheels being pivoted separately to a shaft rigid with the frame structure of a machine, and that common pressure means acting directly on said lever arms are provided for causing said cutting-wheels to penetrate into the piece to be cut while mutually compensating the pressure reactions of said wheels.

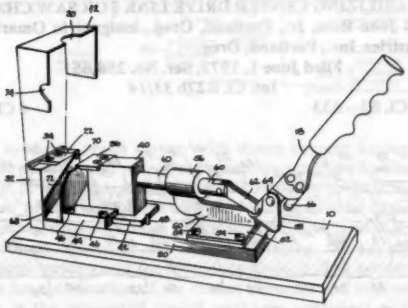
3,748,936

METHOD AND APPARATUS FOR DETACHMENT OF FASTENERS

Arthur J. Minasy, Woodbury, N.Y., assignor to Knogo Corporation, Westbury, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,142
Int. Cl. B26d 7/06
U.S. Cl. 83—162 9 Claims





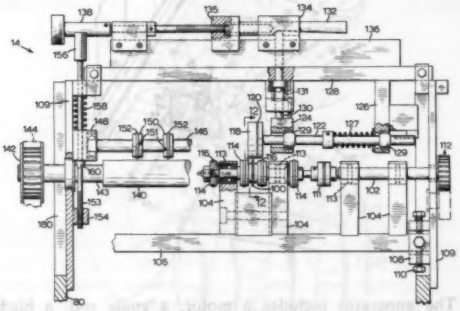
A severing device having a stationary and a movable cutting blade with the edges of each facing each other and the movable blade is actuated by a toggle-like linkage so that the blades come together to shear an element which drops into a chute. The blades are designed to overlap a very small but finite amount upon completion of severing.

3,748,937

CARD SCORING DEVICE

John Albert Long, Toronto, Ontario, Canada, assignor to Longford Equipment International Limited, Ontario, Canada

Filed July 1, 1971, Ser. No. 158,762
Int. Cl. B26d 3/08
U.S. Cl. 83—12 4 Claims



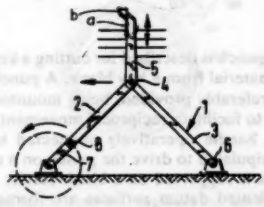
A device for feeding, scoring and stacking cards. In the feeding device each card is fed from a stack onto a moving platform, the trailing edge of the stack being shuffled by passing over a contoured vertical plate. In the scoring device the card passes between a circular blade and a cylindrical follower mounted on a base of large mass and vertically adjustable on the base. In the stacking device a photoelectric beam traverses the line of travel of the cards and when the beam is interrupted it actuates drive means for moving a conveyor which thus moves intermittently to receive the cards in overlapping relationship. In another aspect the stacking device has two conveyors receiving the cards but with opposite slopes, and a pair of opposed nozzles selectively directing an air stream across the line of travel of the cards causes them to be directed onto either one of the two conveyors.

3,748,938

FLYING SHEARS FOR CUTTING RAPIDLY RUNNING SHEET METAL BANDS

Curt Munchbach, Pforzheim-Sonnenberg, Germany, assignor to Irma Ungerer, Pforzheim, Germany

Filed Sept. 2, 1970, Ser. No. 68,899
Claims priority, application Germany, Sept. 2, 1969, P 19 44 427.4
Int. Cl. B23d 25/08
U.S. Cl. 83—305 4 Claims



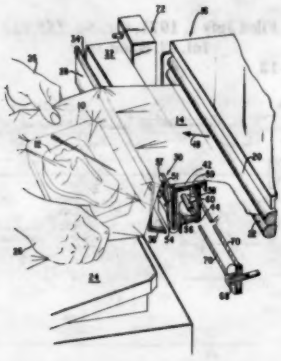
A toggle joint for driving a cutter blade of a flying shears. The blade is connected via a link to the junction of the toggle joint rods. One or both of the opposite ends of the rods perform a cyclic movement, e.g., a rotation.

3,748,939

TRAVERSING FILM CUTTER

Sumner Sheldon Feinstein, West Peabody; Jerold Julius Golner, Lowell; Anthony Salvatore D'Amato, Chelmsford, and Eugene John Trunk, North Andover, all of Mass., assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 11, 1971, Ser. No. 170,707
Int. Cl. B26d 5/08
U.S. Cl. 83—370 16 Claims



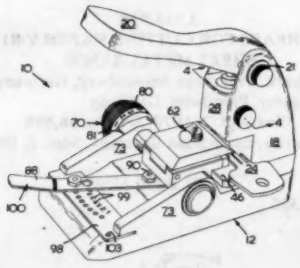
The apparatus includes a motor; a guide rod; a blade mounted for reciprocable movement on the guide rod in response to the actuation of the motor; and an actuating bar over which film is pulled and which energizes the motor in response to the pressure applied to it by the stretched film, the blade is returned to its starting position when the pressure on the actuating bar is removed and the rotation of the motor is thus reversed.

3,748,940

PORTABLE PUNCH

George Muri, Montreal, Canada, assignor to DBM Industries Limited

Filed Aug. 16, 1971, Ser. No. 172,182
Int. Cl. B26d 7/06
U.S. Cl. 83—414 8 Claims



A portable punch is described for cutting a key by selectively removing material from a key blank. A punch and die subassembly is preferably provided, being mounted in a housing on the punch to facilitate reciprocal movement of the punch. An actuating handle operatively connected to this sub-assembly is manipulated to drive the punch on a cutting stroke. The key blank is supported on a blank carrier on which two accurately oriented datum surfaces are formed. The blank carrier is slidably movable in directions parallel to these two surfaces. Movement of the blank carrier is obtained from two cooperating locating means. One locating means preferably includes a shaft element with a central section which coacts with the blank carrier. The central section can be laterally offset from an axis common to two end sections of the shaft element which are journaled in the body of the punch. The other locating means is preferably a lever member pivotally supported on the punch body and having one free end thereof engaging the blank carrier. Each locating means drives the carrier in a direction parallel to one of the datum surfaces. Operating the locating means causes the blank carrier and key blank thereon to be moved to a selected one of a series of predetermined positions. A codified listing of a combination of these positions will enable a key to be cut to a selected configuration. Once the key blank is positioned, the actuating handle is manipulated to drive the punch and remove material from the blank.

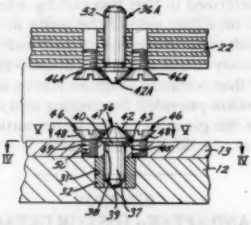
This invention relates to punch constructions generally. More particularly, the present invention relates to punches of the type which are suitable for cutting keys from key blanks. In one preferred embodiment, the punch apparatus to be described below is adapted to be set on a worktable or other such surface, and is hand operated.

3,748,941

GUIDE PIN ASSEMBLY FOR DIE PLATE

Robert E. Richards, Kalamazoo Twp., Kalamazoo County, Mich., assignor to J.A., Richards, Co., Kalamazoo, Mich.

Filed July 30, 1971, Ser. No. 167,654
Int. Cl. B26d 5/08
U.S. Cl. 83—637 10 Claims



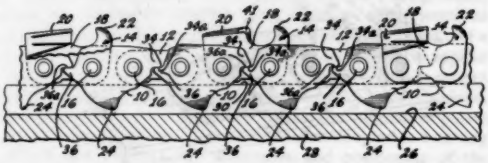
A guide pin assembly mountable upon die parts, said pin assembly having an enlarged frustoconical head which tapers toward the free end thereof and a cylindrical shank which is snugly receivable into aligned openings in first and second die parts to hold them in predetermined relative positions. Further openings are provided in the first die part adjacent to and at a constant radius from the axis of the guide pin, for the reception of screws having frustoconical heads which taper away from the free ends thereof at about the same angle of taper as the head on said guide pin. The heads on the screws firmly engage the head on the guide pin, to hold the guide pin within its opening.

3,748,942

STABILIZING CENTER DRIVE LINK FOR SAW CHAIN

Cecil John Ross, Jr., Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed June 1, 1972, Ser. No. 258,651
Int. Cl. B27b 33/14
U.S. Cl. 83—833 4 Claims



A chain comprised of a conventional sequence of pivotally connected links some of which links have extensions for en-

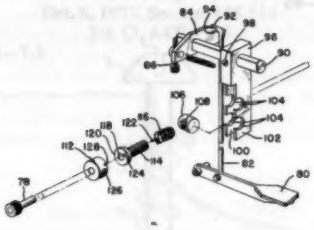
gaging objects, e.g., links wherein the extensions have sharpened edges for engaging and cutting trees. The novelty being the provision of links preceding and following the links having the extensions provided with forwardly projected portions and rearwardly projected portions. The rearwardly projected portions underlie the forwardly projected portions of the following links to restrict independent pivotal movement via leverage action.

3,748,943

STRING MOUNTING AND ADJUSTMENT FOR STEEL GUITARS

Ronald T. Lashley, Burlington, N.C., assignor to Emmons Guitar Company, Inc., Burlington, N.C.

Filed Apr. 7, 1972, Ser. No. 242,079
Int. Cl. G01d *3/14*
U.S. Cl. 84—312 **6 Claims**



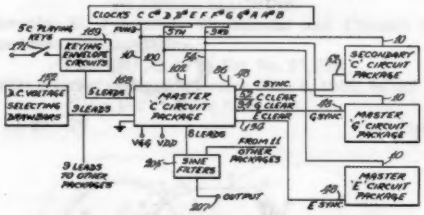
The tension of each string of a musical instrument is adjusted by means of a member which is supported by and slidably displaceable relative to a pivotable lever over which the string passes. The movement of the pivotable lever can be varied by rotation of an elongated rod which projects from the frame of the instrument for actuation of the foot pedal.

3,748,944

INTEGRATED CIRCUIT SYNTHESIS AND BRIGHT WAVE ORGAN SYSTEM

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Deerfield, Ill.

Filed Sept. 29, 1971, Ser. No. 184,810
Int. Cl. G10h *1/06*
U.S. Cl. 84—1.22 **26 Claims**



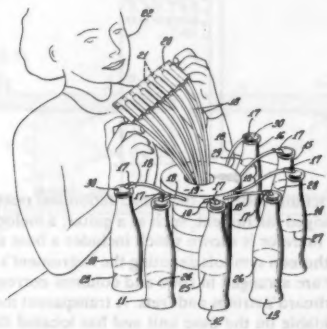
A synthesis organ system with direct current keying, envelope shaping and individual harmonic scaling which makes use of 12 musical signals representative of the notes of the top octave of the instrument and derives other note signals by frequency division and in which MOSFET integrated circuit technology is used in the envelope shaping, the keying, the harmonic scaling and the frequency division. The system provides for optimization of the circuit elements and internal circuits in the integrated circuit packages consistent with the number of package leads and the complexity of the external circuit so as to arrive at a minimum overall cost for the system. Alternatives are described, the choice depending largely upon the overall production quantity required, the relative cost of the packages, and to some extent upon individual preference. Other variations of the basic system are discussed. The system also has provision for all harmonic wave formation by the addition of square waves to provide pedal notes or for enlarging the keyboard resources of the instrument.

3,748,945

PNEUMATIC MUSICAL INSTRUMENT

Justin A. Kramer, 1028 W. 8th Pl., Los Angeles, Calif.

Filed Feb. 14, 1972, Ser. No. 225,838
Int. Cl. G10d *7/00*
U.S. Cl. 84—330 **8 Claims**



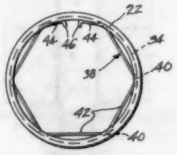
Fixtures are provided for blowing air over the mouths of bottles having the capacity for emitting musical notes of different pitch. Each fixture is provided with a clip-on fastening member capable of being applied to the neck of virtually any standard type of soft drink bottle. An air nozzle has an adjustable mounting on the fastening member so that once the proper position has been established the nozzle can be anchored in position and the fixture will invariably produce the same note as the selected pitch. A hose is connected from the air nozzle to an air supply which may be a keyboard on an air pressure chest or which may be one of a set of individually operated mouth pieces thereby to enable an operator to apply air selectively to the different bottles and in that way to play a tune.

3,748,946

WOODWIND TENON RING AND METHOD

Robert J. Runde, Kenosha, Wis., assignor to G. LeBlanc Corporation, Kenosha, Wis.

Filed Aug. 2, 1972, Ser. No. 277,405
Int. Cl. G10d *7/00*
U.S. Cl. 84—380 **5 Claims**

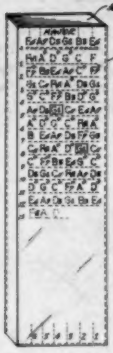


An improved tenon ring and method for use in clarinets and other woodwind instruments. A metallic tenon ring is provided with an interior spring band having chordal sections inward of the tenon ring and adapted to snap into an exterior ring milled in the adjacent clarinet section to retain the tenon ring in position.

3,748,947
MELODY CHORD CONSTRUCTOR FOR STRING INSTRUMENTS

Roger E. Freiheit, Rt. 1, Box 96, Lakebay, Wash.

Filed Jan. 10, 1972, Ser. No. 216,550
Int. Cl. G10b *15/00*
U.S. Cl. 84—485 5 Claims

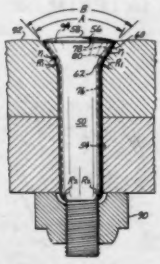


After a brief discussion of the construction and operation of a typical stringed instrument, such as a guitar, a melody chord constructor therefor is shown which includes a base unit having located thereon symbols denoting the instrument's musical notes which are arranged in rows and columns corresponding to the fingerboard's strings and frets. A transparent member is relatively slidable on the base unit and has located thereon a plurality of numerical symbols arranged in rows and columns corresponding to those of the base unit. In one position, the symbols "1" on the slide member register with note symbols on the base unit corresponding to the root notes of an arbitrarily chosen scale, such as G. The remainder of the numerical symbols correspond to the major scale degrees useful in melody chord construction, that is, the 3, 5, 6, 7, *b*7, 9 and 11 degrees, and register with the corresponding notes of the G major scale on the base unit. By translating the slide member relative to the base unit, the notes corresponding to the root and degrees of any other major scale can be readily ascertained. Additional slide members having the various minor scale degrees thereon can be interchanged with the major scale slide member.

3,748,948
FATIGUE RESISTANT FASTENERS

Hubert A. Schmitt, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 5, 1970, Ser. No. 61,153
Int. Cl. F16b *5/02*, *35/00*
U.S. Cl. 85—1 R 6 Claims

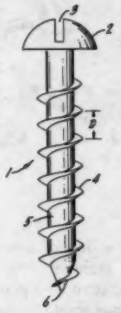


A flush head fastener pin for use in aircraft structural joints which are countersunk for surface flushness. The pin is shaped and adapted to preload the joint material surrounding the countersink to create a predetermined residual stress pattern in that region for improvement of fatigue life. Preferred embodiments of a straight shank bolt, a tapered shank bolt, and a rivet are presented. Each pin embodiment has a 70° conical head and a concave transition portion of specified radius and smoothness interconnecting the head with the shank. The 70° head and transition portion cooperate to conformably deform and preload the countersunk region of the hole, which is preferably provided with a convex surface of specified radius at the base of the countersink, and a conical surface having a greater cone angle than that of the pin. The straight shank bolt embodiment further discloses a hardened convex lead-in portion of specified shape and smoothness extending between the shank and the threads to prevent galling of the hole during installation of the bolt.

3,748,949
THREAD SYSTEM

Geoffrey Dreger, Oakville, Ontario, Canada, assignor to P. L. Robertson Manufacturing Company, Limited, Milton, Ontario, Canada

Filed Oct. 19, 1971, Ser. No. 190,506
Int. Cl. F16b *25/00*
U.S. Cl. 85—46 1 Claim



A threaded member capable of being driven into low density materials has a sharp thread with its leading angle substantially larger than its trailing angle.

3,748,950
PRIMER ORIENTATION TRAY

Fred A. Huntington, Oroville, Calif., assignor to RCBS, Inc., Oroville, Calif.

Filed Sept. 7, 1972, Ser. No. 286,991
Int. Cl. F42b *33/02*
U.S. Cl. 86—24 3 Claims

A shallow tray having a thin, flat bottom plate in the shape of an octagon is formed on its top face with concentric ridges and grooves over an area circumscribed by a circular wall that constitutes a flange engageable by the complemental flange of a slip on circular cover. Primers loosely deposited in random

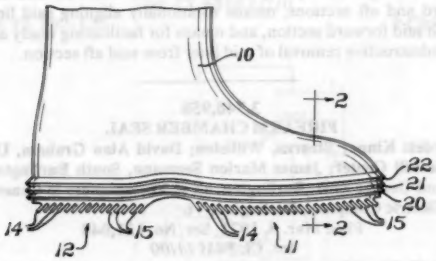
attitudes on the ridge and groove area of the plate are agitated by shaking the tray, so that they will assume full anvil up positions. When the cover is applied and the tray turned upside down, the primers will be seated in full anvil down positions on the flat inner face of the inverted cover so that, when the inverted bottom plate is lifted from the cover, the primers may be picked up by a loading tube. When the cover is applied, certain pairs of opposed sides of the plate project radially beyond the cover flange and provide finger grips which may be grasped simultaneously with the cover flange so that the assembly of plate and cover may be lifted and handled as a unit without fear of their separation.

3,748,951

MUD RESISTANT ELASTOMERS

Roy L. Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 173,961, Aug. 23, 1971. This application Oct. 6, 1972, Ser. No. 295,513
Int. Cl. A43b *1/10*
U.S. Cl. 36—7.3 **8 Claims**



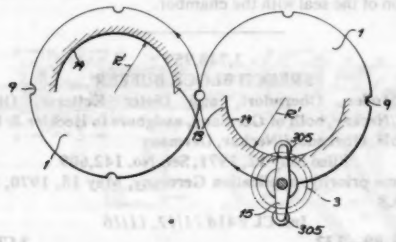
A sole construction such as used on overshoes, boots or shoes having a resilient planar body with a plurality of spaced flexible fins that extend transversely across the body. The fins are evenly spaced and are relatively thin and of the same dimension as the grooves therebetween. All fins are identical and are inclined relative to a horizontal plane. The fin structure is applied to the sides of the boot structure to reduce mud pick-up through the ability of the fins to trap air between adjacent fins.

3,748,952

BRAIDING MACHINE

Aristovoulos G. Petzetakis, Thessaloniki and Chandri St., Moschaton/Piraeus, Greece

Filed July 23, 1970, Ser. No. 57,719
Claims priority, application Greece, Aug. 8, 1969, 40785
Int. Cl. D04c *3/06, 3/18*
U.S. Cl. 87—29 **7 Claims**



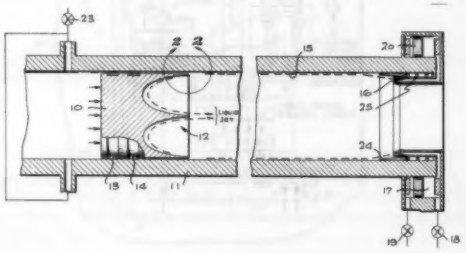
A braiding machine for applying a braided sheath of wire, yarn, thread, or other filamentary material to pipes, tubes, cables, wires and the like. The machine comprises at least one guide having arcuate guide surfaces of alternating curvature extending about the axis along which is positioned the article to be braided. The multiplicity of spindles carrying the filamentary element and mounted upon the freely rotatable pin are carried by nonrotatable feet or supports which are entrained along the guide surfaces by rotating disks having recesses along their peripheries.

3,748,953

WATER CANNON

Charles S. Godfrey, Berkeley, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed Sept. 13, 1971, Ser. No. 179,673
Int. Cl. F41f *1/00*
U.S. Cl. 89—1 R **3 Claims**



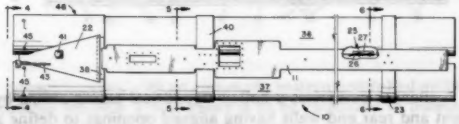
A system is disclosed for producing a pulsed liquid jet of high dynamic pressure using a shaped projectile propelled through a gun barrel into which a liquid has just been injected to form a hollow cylinder or cone. The projectile is shaped to accelerate the liquid inward toward the barrel axis resulting in the production of a jet at high velocity, either by changing the path of the liquid to one along the barrel axis in the direction of projectile motion by an annular cusp shape at the front end of the projectile, or by producing an implosion of the liquid by an essentially annular wedge shape of the projectile which forces the liquid to converge on the gun barrel axis almost instantaneously.

3,748,954

ROCKET LAUNCHER

Vincent J. Taylor, China Lake, and Leslie P. Robison, Inyokenn, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 768,270, Oct. 17, 1968, abandoned. This application Apr. 29, 1971, Ser. No. 138,840
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.807 **4 Claims**



An aircraft mounted rocket launcher has tubes rigidly fastened in only one cross sectional plane to allow for expansion and contraction of the tubes when rockets are fired. The rocket launcher may be fired either in single or ripple mode and incorporates novel safety features which practically eliminate the chance of misfire or premature firing.

3,748,955

CIRCUIT ARRANGEMENT FOR ROCKET LAUNCHERS

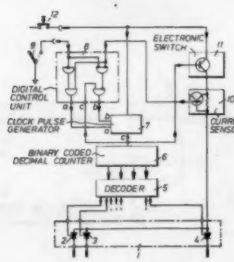
Willi Gatermann; Rolf Sorgel; Hinderk Mudder; Laus-Dietrich Thieme, all of Wedel/Holstein; Herbert Sedlacek, Hamburg-Rissen; Uwe Weers, Elmshorn, and Heinz Hermes, Wedel/Holstein, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 20, 1971, Ser. No. 182,106

Claims priority, application Germany, Sept. 18, 1970, P 20 46 098.4

Int. Cl. F41f 3/04

U.S. Cl. 89—1.814 2 Claims



A rocket launcher firing control circuit in which a series of rockets are fired either individually or automatically in sequence under the control of a mode selector switch control the mode of operation of a clock pulse generator, a counter counting the generator pulses and a decoder controlled by the counter output for firing the detonator caps of a series of rockets in sequence via thyristors connected in parallel to a power source. The control electrode of each thyristor is connected to a separate output of the decoder and the generator is controlled by a digital control unit so that the operation of the system is not impaired by the presence of a faulty rocket detonator unit.

3,748,956

SILENCER FOR FIRE ARMS

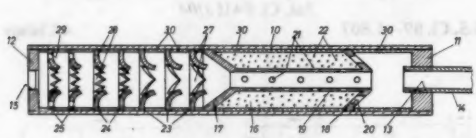
Siegfried Hubner, Stuttgart-Heumaden, Germany, assignor to Carl Walther Sportwaffenfabrik, Ulm/Donau, Germany

Filed June 5, 1972, Ser. No. 259,616

Claims priority, application Germany, June 4, 1971, P 21 27 877.3

Int. Cl. F41c 21/18

U.S. Cl. 89—14 D 7 Claims



A silencer comprises a hollow cylindrical casing closed by front and rear end walls having aligned openings to define a passage therethrough for a bullet and propellant gases emerging from the muzzle opening of a firearm. A plurality of partitions within the casing define chambers with at least one chamber being constructed as a return-flow chamber. The partitions have openings therein for the passage of the bullet with the edges of the openings being serrated and bent toward the rear end wall of the casing. A tubular element with openings therein defines a passage through the return-flow chamber for the bullet and gases.

3,748,957

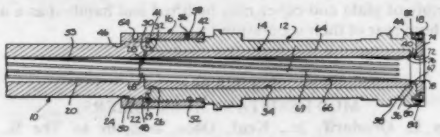
GUN BARREL SYSTEM

William C. Arnold, Milton; Joseph K. Lendway, Burlington; Brian W. Woodman, Burlington; Michael T. McGeehan, Burlington, and David P. Perrin, Hinesburg, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Aug. 23, 1971, Ser. No. 173,845

Int. Cl. F41f 17/08

U.S. Cl. 89—16 7 Claims



A gun barrel system comprises a barrel forward section, a barrel aft section, collar means retaining said forward and aft sections together, a liner disposed within said aft sections, means longitudinally capturing said liner between said forward and aft sections, means rotationally aligning said liner with said forward section, and means for facilitating ready and nondestructive removal of said liner from said aft section.

3,748,958

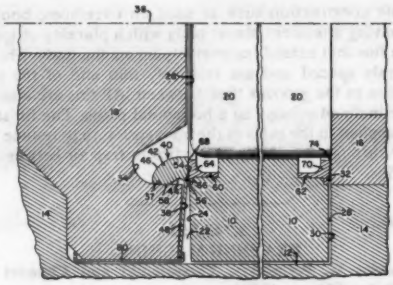
FIREARM CHAMBER SEAL

Burdett Kinney Stearns, Williston; David Alan Graham, Underhill Center; James Marion Seemann, South Burlington, and George Zink, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Mar. 4, 1971, Ser. No. 121,048

Int. Cl. F41f 11/00

U.S. Cl. 89—26 5 Claims



The provision of a lightweight, strong, arched seal with a substantially conical face and a plurality of spring fingers to insure full seating before ignition along the innermost annular junction of the seal with the chamber.

3,748,959

BREECH BLOCK BUFFER

Tilo Moller, Oberndorf, and Dieter Ketterer, Oberndorf/Neckar, both of Germany, assignors to Heckler & Koch GmbH, Oberndorf/Neckar, Germany

Filed May 12, 1971, Ser. No. 142,609

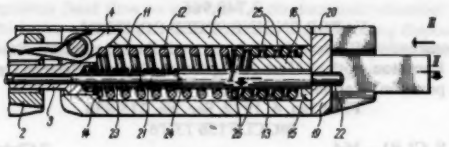
Claims priority, application Germany, May 15, 1970, P 20 23 816.8

Int. Cl. F41d 11/12, 11/16

U.S. Cl. 89—132 3 Claims

An automatic firearm incorporates a shock absorber in which a buffer spring is accommodated in a bore in the breech block and bears at one end against a buffer member which is supported by means of a slider to which the buffer movement is imparted and which extends transversely to the direction of

movement of the buffer member and is accommodated in a slot in said member. Preferably the buffer spring encloses a



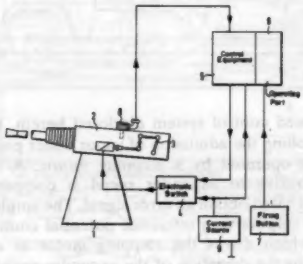
striker pin the end of which is exposed in the slot and adapted for operation by a hammer for initiating firing of the weapon.

3,748,960

FIRING-RATE AND RHYTHM CONTROL APPARATUS FOR AUTOMATIC WEAPONS

Gunter Mindel, Dusseldorf, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Apr. 9, 1971, Ser. No. 132,732
Int. Cl. F41d *11/10*
U.S. Cl. 89—135 **9 Claims**



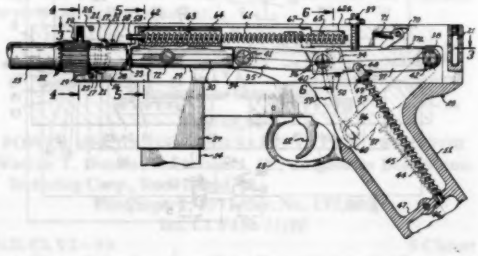
The firing-rate and rhythm control of an automatic weapon are effected electrically by means of a control circuit in which shot-counting is sensed at the weapon itself and timing is effected by a clock wavetrain generator. Means are provided to ensure firing of the correct number of shots per burst when operating the weapon both at natural firing rate and at reduced firing rate.

3,748,961

ADJUSTABLE HESITATION BLOW-BACK OPERATED GUN TOGGLE MECHANISM

Walter E. Perrine, P. O. Box 66, Navajo, Ariz.

Continuation-in-part of Ser. No. 53,078, July 8, 1970, Pat. No. 3,709,091. This application May 15, 1972, Ser. No. 253,053
Int. Cl. F41c *5/00*
U.S. Cl. 89—189 **6 Claims**



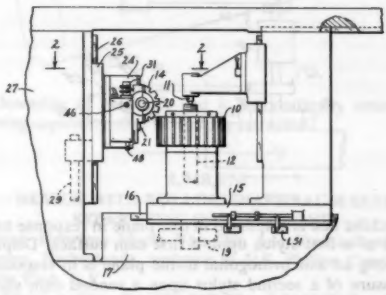
A toggle action piston in which an under-center toggle employing toggle links of two predetermined sizes providing a given hesitation is tripped to recede into its handle by the effects of gas pressure generated at the time of firing.

3,748,962

HOB SHIFTER

Thomas L. Hilkert; Goran E. Fransson, and Richard E. Trenbeath, all of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Dec. 16, 1971, Ser. No. 208,752
Int. Cl. B23f *5/22*
U.S. Cl. 90—4 **6 Claims**



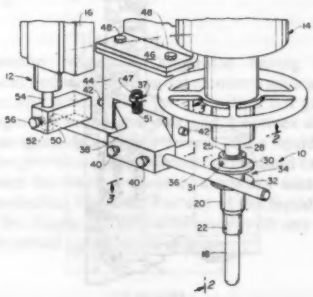
Signal pulses are produced and counted in response to axial shifting of the hob and are used to effect stopping of the hob when the latter has moved through a commanded distance.

3,748,963

DUAL TRACER INTERCONNECTING MEANS

George W. Stringer, 8400 Glenoaks, Sun Valley, Calif.

Filed Apr. 25, 1972, Ser. No. 247,314
Int. Cl. B23c *1/16*
U.S. Cl. 90—13 B **9 Claims**



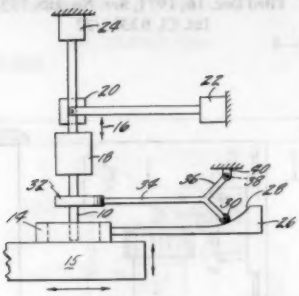
In combination with an automatic pattern controlled milling machine wherein a first tracer is to be employed to transmit horizontal motion to a cutting tool and a second tracer is intended to be separately employed to impart vertical motion to a cutting tool, an interconnecting means connecting the first tracer and the second tracer comprising a sytlus which is connected to the first tracer and movable vertically in respect thereto, an elongated rod connected to the stylus and adapted to move vertically simultaneously with the stylus, the free end of the rod connected to the second tracer, a pivot bar secured intermediate the ends of the rod, the pivot bar pivotaly attached to the housing supporting the second tracer.

3,748,964

ONE DIMENSION CAM TRACER FOR AN AUTOMATIC MILLING MACHINE

Herbert A. Whitney, Windsor, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 31, 1972, Ser. No. 258,278
Int. Cl. B23c 1/16
U.S. Cl. 90—13 B 2 Claims



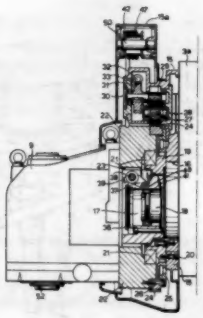
A machine bed is displaced in one plane in response to the pressure of a first stylus upon a first cam surface. Displacement along an axis orthogonal to the plane is in response to the pressure of a second stylus upon a second cam surface which is transmitted via a lever and a gimbal to the first stylus.

3,748,965

ANGULARLY ADJUSTABLE ATTACHMENT FOR A MACHINE TOOL HEADSTOCK

Maso Galbarini, Pavia, and Francesco Cotta Ramusino, Milan, both of Italy, assignors to Innocenti Societa Generale Per L'Industria Metallurgica E Meccanica, Milan, Italy

Filed Jan. 31, 1972, Ser. No. 221,964
Claims priority, application Italy, Mar. 31, 1971, 68076 A/71
Int. Cl. B23c 1/12
U.S. Cl. 90—17 10 Claims



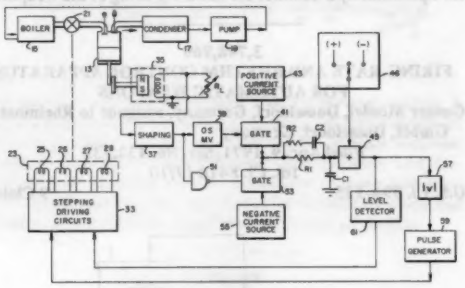
A machine tool having a device on the end of the headstock for the automatic attachment of various fittings which are used on the machine from time to time. The device comprises two relatively rotatable members, a first one attached securely to the headstock and a second one adapted for carrying the fittings. A motor is provided on the first member for effecting rotational movement of the second member so that a fitting on the device can take up any desired angular position with respect to the headstock. The machine is provided with a deposit or store arrangement having a plurality of frames for storing the fittings in predetermined orientations such that the machine can deposit and take up fittings automatically. To this end each frame is fitted with automatic sinewing devices which sinew on the fittings when the headstock of the machine is correctly aligned with the fitting.

3,748,966

VAPOR ENGINE SPEED CONTROL

Constantine D. Pezaris, Nahant, and Paul J. Trame, South Hamilton, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 6, 1972, Ser. No. 215,838
Int. Cl. F15b 13/16
U.S. Cl. 91—364 7 Claims



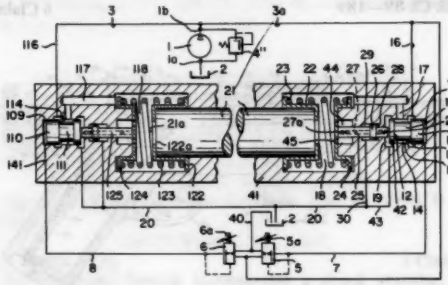
In the speed control system disclosed herein, the throttle valve controlling the admission of vapor under pressure to an expander is operated by a stepping motor. A tachometer signal responsive to expander speed is compared with a reference signal to obtain an error signal. The amplitude of the error signal relative to a reference potential controls a pulse generator which drives the stepping motor at a rate corresponding to the deviation of the expander speed from that desired, while the polarity of the error signal controls the direction in which the stepping motor is driven.

3,748,967

POSITION-CONTROL DEVICE OPERATED BY FLUID PRESSURE

Rudolf Richter, Hosbach, and Walter Kropp, Obernau, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Nov. 5, 1970, Ser. No. 87,294
Claims priority, application Germany, Nov. 6, 1969, P 19 55 926.3
Int. Cl. F15b 13/16
U.S. Cl. 91—387 8 Claims



A control device for positioning a body, e.g. a valve, slide or actuator for a stepless hydrostatic transmission in which a con-

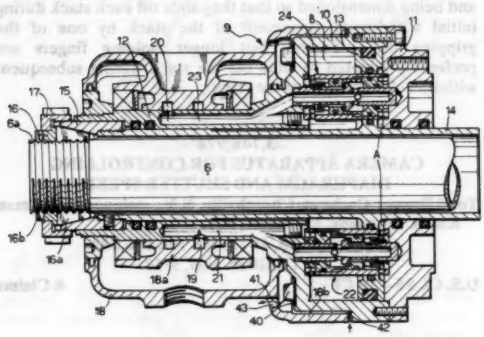
trol piston is displaced by a control fluid pressure and a working piston is coupled with the actuated member for movement in response to the control pressure independently of external influences upon it. The control piston operates a valve which regulates fluid flow to and from a displacement chamber in which the working piston is shiftable, a spring being disposed within this chamber and acting upon the control piston with a force determined by the position of the working piston.

3,748,968

ROTARY FLUID CYLINDER FOR SELF-CENTERING CHUCK

Franca Pinto, Turin, Italy, assignor to Mario Pinto S.P.A., Turin, Italy

Filed Apr. 7, 1971, Ser. No. 132,025
Claims priority, application Italy, May 9, 1970, 68605 A/70
Int. Cl. F15b *11/08, 13/042*
U.S. Cl. 91—420 **5 Claims**



A rotary cylinder for a self-centering chuck has two valve units in its interior to prevent escape of fluid from the cylinder should the pressure fail in the conduit supplying fluid to keep the chuck jaws locked. The valve units each comprise inner and outer tubes passing through the piston, an annular space being defined between them, the inner tube communicating with a conduit passing through the cylinder body, an annular ridge on the outer surface of the inner tube, a hole in the wall of the inner tube adjacent the ridge and on a first side of it, and holes in the ends of the outer tube to communicate with the chambers into which the piston divides the cylinder. A closure member is located between the tubes on the second side of the ridge, being biased towards the ridge. A control member is sealingly slidable in the first part between the tubes and has a projection which can, under a pressure differential, move the closure member off the ridge to permit fluid to flow past the ridge and the closure member and thus enter the chamber beyond the closure member.

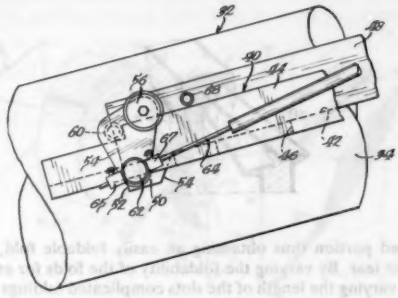
3,748,969

POWER MECHANISM AND SAFETY LOCK THEREFOR

Warren T. Hansen, Rock Island, Ill., assignor to Bear Manufacturing Corp., Rock Island, Ill.

Filed Sept. 1, 1971, Ser. No. 177,000
Int. Cl. F15b *15/26*
U.S. Cl. 92—19 **5 Claims**

A lift rack having pivotally collapsable legs is lifted by a hydraulic cylinder. A safety locking device associated with the cylinder includes a bar that moves into successive latching positions with an underlying rack during extension of the cylinder. The locking device may be manually released during



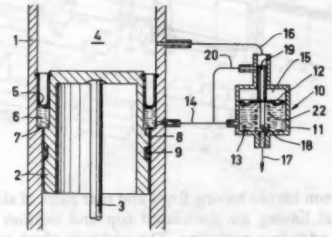
the lowering of the rack and is automatically returned to latching capability after being fully retracted.

3,748,970

DEVICE WITH ROLLING DIAPHRAGM SEAL SEPARATING GAS AND LIQUID

Herman Henricus Maria Van Der AA, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 621,847, March 9, 1967, Pat. No. 3,547,005. This application Apr. 17, 1970, Ser. No. 33,133
Int. Cl. F15b *21/04*
U.S. Cl. 92—83 **7 Claims**



This invention relates to apparatus having a rolling diaphragm seal between two coaxial elements such as a piston and cylinder, and is adaptable for use with a hot gas engine. The diaphragm has a concave side and a convex side which separate a gas space on one side thereof and a liquid space on the other. For preventing the pressure of the fluid on the concave side from becoming excessive, a control means is provided for conducting liquid into or out of the liquid space on one side of the diaphragm, to correspond with any excessive pressure differential across the diaphgram.

3,748,971

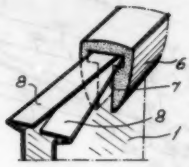
METHOD FOR OBTAINING A CONNECTION BETWEEN A SHEET MEMBER AND A SUSPENSION MEMBER

Carl Erik Grundell, 8 Osmagatan 122 48, Enskede, Sweden

Filed May 5, 1972, Ser. No. 250,797
Int. Cl. B31f *5/02*
U.S. Cl. 93—1 E **7 Claims**

To obtain a connection between a foldable sheet material member and a suspension or stiffening member said sheet material member is first provided with a longitudinal bead having a wider upper portion and a narrower lower portion, whereupon the bead is sideways introduced in a corresponding downwardly open groove in the suspension or stiffening member. The bead is made by folding the sheet material along a plurality of folding lines, located in near vicinity to each

other, at least some of said folding lines being made by punching in the sheet material a plurality of elongated slots, leaving between two adjacent slots a relatively long un-



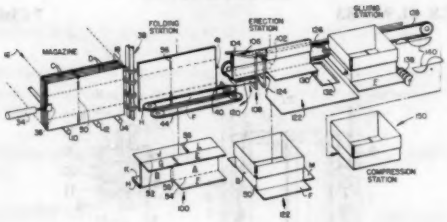
punched portion thus obtaining an easily foldable fold, difficult to tear. By varying the foldability of the folds for example by varying the length of the slots complicated foldings may be easily obtained in automatic processes.

3,748,972

METHOD AND APPARATUS FOR ERECTING AND BOTTOM SEALING CARTONS

Bruce H. Barton, South Windsor, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed Nov. 1, 1971, Ser. No. 194,642
Int. Cl. B31b *5/02*
U.S. Cl. 93—53 M **19 Claims**



Flat carton blanks having front and rear pairs of side panels, each panel having an associated top and bottom flap, are stored on edge in a magazine. The endmost blank is fed from the magazine in its own plane to a folding station, thence to an erection station, and finally through a gluing station to a compression station. The folding station has upper and lower pivoted plows for folding the top and bottom flaps respectively to the same side of the plane defined by the flat carton blank. Certain of these flaps are subsequently folded back through this plane so that the flaps project from the carton in both directions. One of the bottom flaps is left folded to its "wrong" side and this particular flap is used to erect the carton at the erection station.

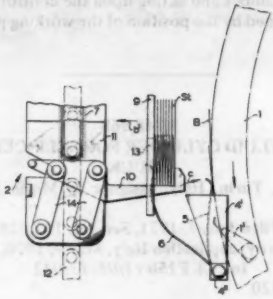
3,748,973

APPARATUS FOR COLLECTING AND WITHDRAWING STACKS OF BAGS DELIVERED BY A DEPOSITING CYLINDER

Helmut Kuck, Intrup, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed July 29, 1971, Ser. No. 167,154
Claims priority, application Germany, Aug. 11, 1970, P 20 39 942.2
Int. Cl. B31b *1/98*; **B65b** *27/08*
U.S. Cl. 93—93 DP **5 Claims**

In a bag-making machine where the bags are discharged by a cylinder and deposited on a substantially horizontal table disposed at the cylinder periphery, apparatus for collecting and withdrawing stacks of the deposited bags comprises gripping units effective to take successive stacks from the table and withdraw them from the cylinder and holding fingers for engaging the successive stacks, the holding fingers projecting upwardly through apertures in the table, being movable lengthwise of the table, being spring-influenced towards the cylinder, having their ends spaced from the cylinder periphery



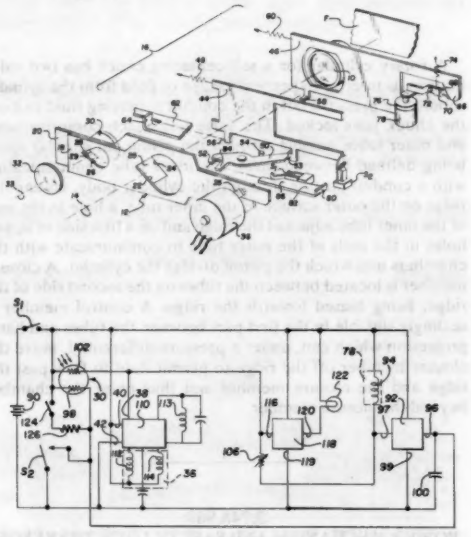
and being dimensioned so that they slide off each stack during initial withdrawal movement of the stack by one of the gripping units. Further but longer holding fingers are preferably adapted to slide off the stack during subsequent withdrawal movement of the stack.

3,748,974

CAMERA APPARATUS FOR CONTROLLING DIAPHRAGM AND SHUTTER SPEED

Todd Dresser Cochran, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 13, 1971, Ser. No. 180,038
Int. Cl. G03b *7/08*, *9/18*
U.S. Cl. 95—10 CE **6 Claims**



An exposure control system for use in photographic apparatus which provides automatic adjustment of the exposure aperture and the exposure interval as a function of incident scene illumination. In particular, the exposure control system includes a radiation sensitive assembly disposed to receive scene radiation for controlling the energization of an indicator

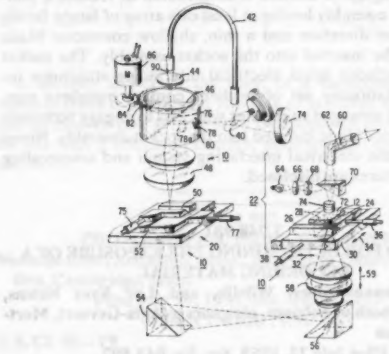
means such as a lamp and for varying the charge upon a capacitor. The lamp is energized to indicate that there is insufficient illumination to provide proper exposure of the normal exposure interval. If an extended or time exposure is made, the lamp is de-energized to provide an indication of the end of the extended exposure interval. Preferably, first and second trigger circuits are used to energize respectively the indicator lamp and the closing of the associated shutter mechanism. A feedback circuit is provided from the second trigger circuit to the first trigger circuit so that at the termination of the exposure interval, the indicator lamp will be de-energized.

3,748,975

APPARATUS FOR AND METHOD OF CORRECTING A DEFECTIVE PHOTOMASK

Martin Tarabocchia, Cliffside Park, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 3, 1972, Ser. No. 214,921
Int. Cl. G03b
U.S. Cl. 95—1 R **6 Claims**



A defect, in a metal photomask, that is either to be etched away, if opaque, or to be rendered opaque, if light-transmitting, is corrected, with the aid of novel apparatus, in a novel method of: (a) depositing a photoresist coating over a patterned film on one surface of the photomask, (b) focusing a projected shaped beam of light, incapable of exposing the photoresist coating, onto the photoresist coating, (c) aligning the focused beam, by viewing it from a surface of the photomask opposite to that which the photoresist coating is on, so that the light overlays the defect, (d) changing the characteristics of the beam of light so as to expose the photoresist coating, and (e) developing the photoresist coating. Depending upon the kind of photoresist coating used, the defect can now be either etched away or rendered opaque.

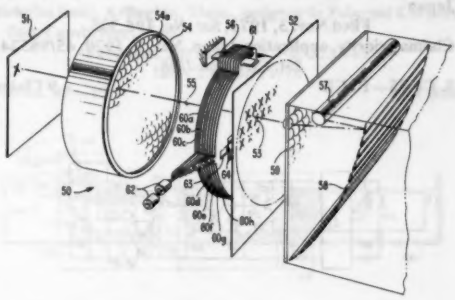
3,748,976

SELECTION SYSTEM

Raymond L. Fowler, and Roderick S. Heard, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,307
Int. Cl. B41b *21/26*
U.S. Cl. 95—4.5 **9 Claims**

Information items are selected by permutative positioning of a group of adjacent two-position slide members. The slide members are characterized by their compact arrangement of blocking and passing code portions which cooperate with both of two adjacent information transmission channels. The compactness of the system, achieved by the code portion arrangement, is accompanied by some loss in code set efficiency as to the number of outputs selectable from a permutation of a



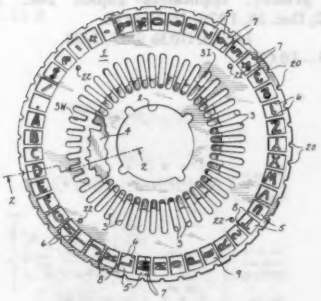
given order; however, certain unique and repetitive patterns exist by which reasonable efficiency can be achieved.

3,748,977

DISC FOR LABEL-MAKING MACHINE AND METHOD OF MANUFACTURE

James M. Mrozek, Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Feb. 16, 1972, Ser. No. 226,707
Int. Cl. B41b *15/12*
U.S. Cl. 95—85 **9 Claims**

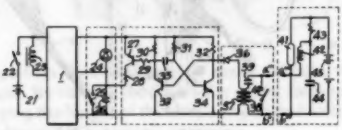


Ultraviolet light, directed through a character template, forms an image on sensitized tape below. The disc includes a rigid support member having a series of windows formed around its periphery and a series of slots formed radially inward therefrom. A sheet of heat conductive opaque material is bonded to a sheet of transparent backing material and a proportional spacing template and a character template are formed by etching away portions of the conductive sheet. The spacing template is bonded to the support member and operates to alter the length of each opening formed by the slots to thereby control the tape drive mechanism. The character template is also bonded to the support member, with each image, or character in the template positioned under a window.

3,748,978
EXPOSURE TIME CONTROLS FOR CAMERAS OPERATING WITH FLASH ILLUMINATION

Hirofumi Yoshimura, Okaya; Hisatoshi Takahata, Nagano; Akio Furuhata, Okaya, and Susumu Nishimura, Nagano, all of Japan, assignors to Kabushiki Kaisha Yashica, Tokyo, Japan

Filed Nov. 3, 1971, Ser. No. 195,305
Claims priority, application Japan, Nov. 9, 1970, 45/98524
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CE 9 Claims

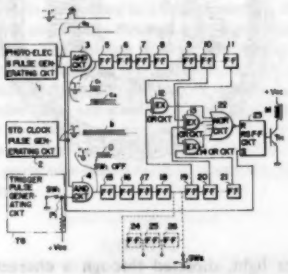


A camera which can provide flash illumination, particularly for reducing the exposure time. The camera shutter is automatically closed when the charge of a timing capacitor increases to a given extent. Simultaneously with the creation of the flash illumination, a suitable circuit generates an electrical signal which is used to charge the capacitor so as to coact therewith for achieving a predetermined exposure time. The capacitor is also charged by a photosensitive element which responds to the light created during flash illumination, so that the predetermined exposure time will be reduced to the extent that the capacitor is charged by the photosensitive element.

3,748,979
ELECTRONIC SHUTTER APPARATUS FOR CAMERAS

Yasuhiro Wada, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Dec. 14, 1971, Ser. No. 207,807
Claims priority, application Japan, Dec. 28, 1970, 45/125412; Dec. 28, 1970, 45/125413
Int. Cl. G03b 9/62, 7/08
U.S. Cl. 95—10 CT 11 Claims

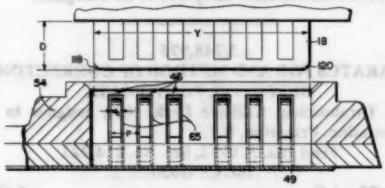


An electronic shutter apparatus suitable for single lens reflex cameras, arranged so that the storing of information on the brightness of the object to be photographed which is performed prior to photographing and the read-out of this stored information which is conducted at the time of actual photographing are both effected by the use of a digital circuitry, whereby the stored information on the brightness of the object to be photographed can be reproduced always with accuracy and without failure.

3,748,980
FLASH SOCKET ASSEMBLY

Edison R. Brandt, Cohasset; David V. Cronin, Peabody, and James K. Skurski, Beverly, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 204,834
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 7 Claims

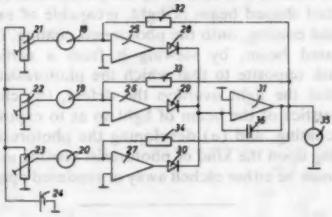


An extremely shallow flash socket assembly for use in or with a photographic camera is constructed to receive a multilamp flash assembly having at least one array of lamps facing in a common direction and a thin, shallow connector blade adapted to be inserted into the socket assembly. The socket assembly includes novel electrical interfacing structures including a stationary set of resilient contact members constructed and arranged to register with and to engage terminals on a connector blade inserted into the socket assembly. Novel features of the electrical interfacing system and cooperating socket structures are disclosed.

3,748,981
METHOD FOR DETERMINING THE EXPOSURE OF A RECORDING MATERIAL

Karel Germanus Staes, Wilrijk, and Luc Yves Natens, Berchem, both of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed July 22, 1969, Ser. No. 843,597
Claims priority, application Great Britain, July 22, 1968, 34,896/68
Int. Cl. G03b 33/00
U.S. Cl. 95—12.2 4 Claims



A method and apparatus for photographically recording colour subjects onto recording material which is spectrally sensitive in different regions of the visible light spectrum.

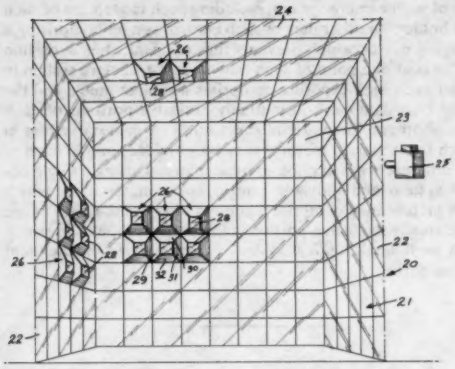
The luminance of the colour subject is measured in at least two of the different regions wherein the recording material is sensitive, the exposure of the recording material is predetermined in taking the measured luminance of the subject in the region of greatest luminance more into account than the measured luminance(s) of the region(s) of smaller luminance, and the recording material is exposed to the colour subject to an extent which is in accordance with said predetermined exposure.

3,748,982

SECURITY DEVICE

Gordon E. Ries, 4423 3rd Ave. East, Bradenton, Fla.

Filed Nov. 30, 1971, Ser. No. 203,222
Int. Cl. G03b 37/00
U.S. Cl. 95—15 1 Claim



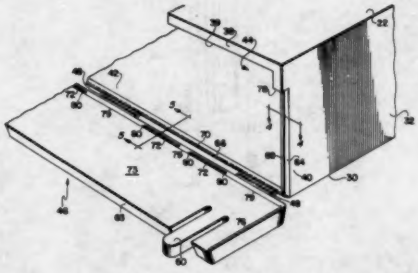
A security device in the form of a surveillance system, wherein there is provided a plurality of reflector surfaces that can be used to give or provide a composite or mosaic picture for use with a television camera, photographic equipment or the like.

3,748,983

PHOTOGRAPHIC FILM CONTAINER

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 16, 1971, Ser. No. 163,212
Int. Cl. G03b 19/10
U.S. Cl. 95—19 22 Claims



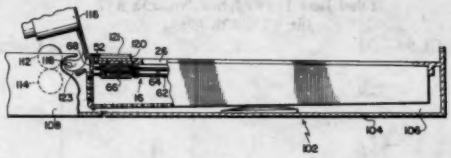
An improved container for receiving and supporting photographic materials including a plurality of film units. An opening, defined by leading ends of a forward, rear, and a pair of side walls of the container, is provided for inserting the materials into the container. Thereafter a leading end wall is adapted to be ultrasonically bonded to the leading ends of the side and rear walls to partially close the opening and cooperate with the forward wall to define a withdrawal aperture through which the film units may be sequentially extracted from the container after exposure. The effective opening of the withdrawal aperture is controlled by a stop integrally formed with the leading end wall and adapted to be accurately spaced from an interior surface of the forward wall to insure that only one film unit at a time may be withdrawn from the container. Cooperating structure is provided at the interface between the rear wall and the leading end wall to insure accurate positioning of the stop with respect to the interior surface of the forward wall during an ultrasonic bonding cycle.

3,748,984

PHOTOGRAPHIC FILM ASSEMBLAGE AND APPARATUS

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1971, Ser. No. 213,989
Int. Cl. G03b 19/10
U.S. Cl. 95—19 40 Claims



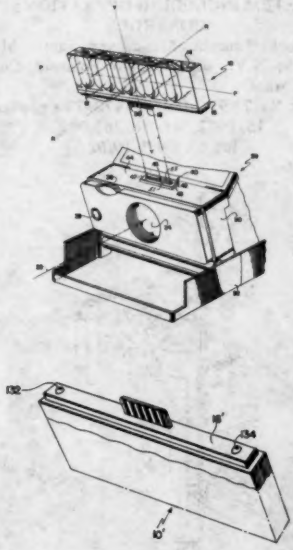
A photographic film assemblage including a film container holding a plurality of film units and having a withdrawal slot in one end thereof. The container is provided with a withdrawal slot light sealing arrangement in the form of a primary light sealing sheet and a secondary light sealing end cap which is movable from a closed light-blocking position to an open position permitting film units to be advanced through the withdrawal slot. The end cap is configured to cooperate with structure within a photographic apparatus with which the film assemblage is adapted to be used for automatically moving the end cap from its closed position to its open position in response to inserting the film assemblage into the apparatus.

3,748,985

PHOTOFLASH APPARATUS

Edison R. Brandt, Boca Raton, Fla., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 204,844, Dec. 6, 1971, abandoned. This application June 8, 1972, Ser. No. 260,916
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 5 Claims



An extremely shallow flash socket assembly for use in or with a photographic camera is constructed to receive a mul-

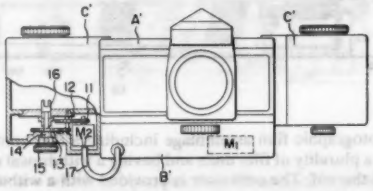
tilamp flash assembly having at least one array of lamps facing in a common direction and a thin, shallow connector blade adapted to be inserted into the socket assembly. Anti-roll, anti-pitch, and anti-yaw structures are provided for accurately orienting and stabilizing the flash assembly in the socket assembly.

3,748,986

MOTOR DRIVE SYSTEM FOR CAMERA

Shuji Kimura, and Koichi Daitoku, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 1, 1972, Ser. No. 258,837
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 **1 Claim**



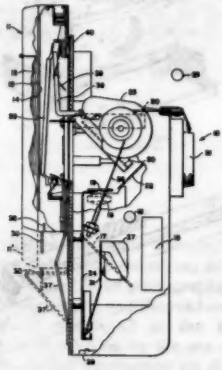
A motor drive system for a camera comprises a short-film motor drive means including a first motor for charging the camera's shutter and winding a film, and actuating a shutter releasing means; and a long-film magazine including a second motor for rotating a long-film take-up shaft to take up a film. The short-film motor drive means and the long-film magazine are separable from each other. A control switch member for the second motor is provided in the short-film motor drive means. The switch member is adapted to be closed with the winding operation of the short-film motor drive means and to be opened upon completion of the winding operation. A cable is provided to electrically connect the switch member with the second motor in the long-film magazine. The two motors are parallel-connected witha power source so that they cooperate to wind the film and charge the shutter and that only the first motor operates to release the shutter.

3,748,987

CAMERA SYSTEM INCLUDING OPERATION SEQUENCE CONTROL

Albion P. Bjork, Lincoln, Mass., and James M. Conner, Mamoroneck, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 77,916, Oct. 5, 1970. This application June 15, 1972, Ser. No. 263,002
Int. Cl. G03b *19/02*
U.S. Cl. 95—36 **4 Claims**



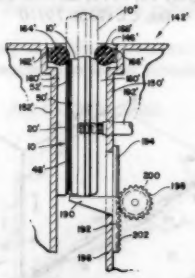
A camera system which, on a single sheet of photographic material, exposes first one area of such sheet of photographic material and thereafter another area of such sheet of photographic material. An optical system for forming images on such photographic material during such exposures. A film holder movable to present such photographic material sheet areas in sequence to such optical system. A system of operational control of such camera system including such movement of such film holder. One part of such control system including indicator lights responsive to various steps of operation of such camera system, including such movement of such film holder. Another part of such control system comprising a covering device which prevents film removal when such film holder is at one point of such movement. A camera system in which each such exposure comprises a subject image and the image of a data card on mutually exclusive portions of each such photographic material sheet areas. A camera system in which two separate pictures may be provided, one in each of two separate areas of photographic material, using a single optical system and movable photographic material, in which each picture may comprise a subject image and a data image on mutually exclusive portions of such picture, and in which each such single optical system comprises two independent optical paths.

3,748,988

APPARATUS FOR HOLDING AND EJECTING A PHOTOGRAPHIC CASSETTE

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 838,794, July 3, 1969, Pat. No. 3,593,643. This application Dec. 30, 1970, Ser. No. 102,936
Int. Cl. G03b *1/04*
U.S. Cl. 242—198 **10 Claims**



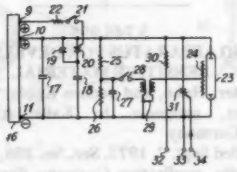
Apparatus for receiving a cassette containing a pod of processing fluid for photographic material, for rupturing such pod and for expelling such fluid therefrom. Typically, the fluid filled pod is mounted within the cassette adjacent a support surface and initially protected by a removable cover plate. After removing the aforementioned cover plate to expose the pod, the cassette is inserted into the apparatus between a pair of resiliently compressible rollers mounted for rotation about parallel axes. One of these rollers exerts a force progressively across the pod during the insertion process whereby the pod is ruptured and the fluid expelled therefrom. The rollers are compressed by the cassette as the cassette passes therebetween and expand over an end of the cassette when the cassette has been fully inserted into the apparatus to exert a force against the cassette tending to lock it in position. Alternate embodiments of force applying devices are described for ejecting the cassette from the apparatus against the locking force of the rollers.

3,748,989

ELECTRONIC FLASH SYSTEM

Itsuki Ban, Tokyo, Japan, assignor to Secoh Giken Company Limited and Miyata Electric Works, Inc., Tokyo, Japan

Filed Dec. 3, 1971, Ser. No. 204,579
Claims priority, application Japan, Dec. 5, 1970, 45/107198
Int. Cl. G03b 15/05
U.S. Cl. 95—10 CE 17 Claims



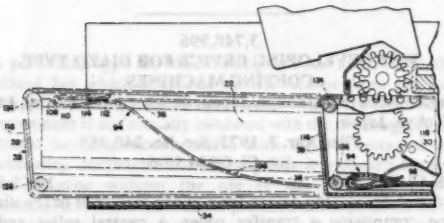
An electronic flash system including a flashtube for producing a controlled quantity of light energy, a plurality of capacitors in which is stored electrical energy to be translated into the light energy in the flashtube and which are to be selectively coupled to the flashtube, a monitoring circuit for generating a signal when the quantity of the light energy produced by the flashtube has reached a predetermined value, bypass means for causing the electrical energy discharged from a capacitor coupled to the flashtube to bypass the flashtube in response to the signal generated by the monitoring circuit, and a control circuit becoming operative when the electrical energy discharged from the capacitor that has been coupled to the flashtube falls short of a desired quantity of light energy to be produced and selectively coupling the rest of the capacitors to the flashtube until the desired quantity of light energy is emitted thereby.

3,748,990

PHOTOGRAPHIC APPARATUS

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 178, Jan. 2, 1970, abandoned. This application Sept. 17, 1971, Ser. No. 181,408
Int. Cl. G03b 19/10
U.S. Cl. 95—30 16 Claims



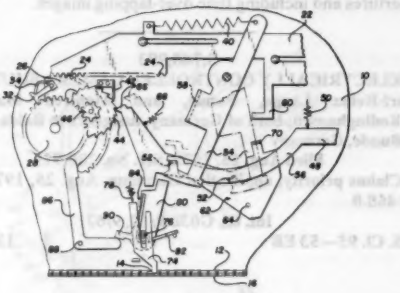
A photographic apparatus is provided with a variable geometry lighttight chamber which is adapted to expand, as it is extended from a housing to receive a film unit being advanced therefrom, and to contract as it is retracted into the housing to transport the film unit to a storage position within the housing.

3,748,991

DEVICE FOR PREVENTING FILM MOVEMENT IN STILL CAMERAS

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,628
Int. Cl. G03b 19/04
U.S. Cl. 95—31 FM 7 Claims



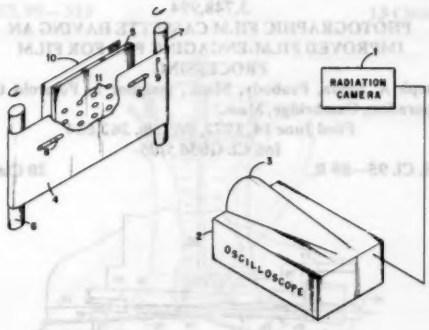
A camera for perforated roll film includes a transport mechanism for advancing film along an exposure plane and a metering mechanism for selectively disabling the transport mechanism. A film sensing pawl is movable by advancing film from an extended position traversing the film through a film perforation to a metering position spaced from the extended position in the direction of film advancement. A control member is movably mounted in the camera for movement with the sensing pawl and is associated with the metering mechanism for disabling the transport means when the sensing pawl reaches its metering position. A spring force on the control member urges the sensing pawl from its metering position toward its extended position. Means are provided for relieving the spring force on the sensing pawl at least during operation of the camers's exposure mechanism so that the spring force is not transmitted through the sensing pawl to the film.

3,748,992

MULTIPLE LENS CAMERA FOR OBTAINING TIME SEQUENTIAL IMAGES

Hal O. Anger, Berkeley, Calif., assignor to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Filed Jan. 22, 1971, Ser. No. 108,826
Int. Cl. G03b 9/08
U.S. Cl. 95—36 6 Claims



A multiple lens photographic camera for recording a plurality of sequential views of time-dependent images, such as the oscilloscope output of a radioisotope camera from which images of the distribution of radioactive material in a living or-

ganism may be obtained, comprising a moving opaque curtain shutter system having round or elongated slot apertures, or a combination thereof, therein, a plurality of lenses juxtaposed said shutter system, and a photographic film over-lapping said plurality of lenses; said oscilloscope output, lenses, and photographic film in focus alignment permitting images of a series of light dots appearing on the oscilloscope screen to be formed on different portions of the photographic film in a sequence according to which lens or lenses are uncovered by the shutter apertures and including time over-lapping images.

3,748,993

ELECTRICALLY CONTROLLED CAMERA SHUTTER

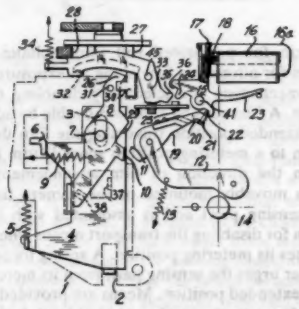
Karl-Heinz Lange, Bunde, and Manfred Mailander, Rodinghausen, both of Germany, assignors to Balda-Werke, Bunde, Germany

Filed Aug. 15, 1972, Ser. No. 280,915

Claims priority, application Germany, Aug. 25, 1971, P 21 42 468.0

Int. Cl. G03b 9/10, 9/62

U.S. Cl. 95—53 EB **12 Claims**



An electrically controlled camera shutter in which a shutter blade is swingable between shutter-closing and shutter-opening positions and is fixed with a shutter lever which is swingable with the shutter blade. An electromagnet includes an armature, and a swingable armature lever carries the armature and has a catch portion which coacts with a springy portion of the shutter lever to hold the shutter blade in its open position when the electromagnet is energized. When the electromagnet becomes unenergized it releases the armature lever so that the catch portion thereof releases the shutter lever enabling the shutter blade to return to its shutter-closing position.

3,748,994

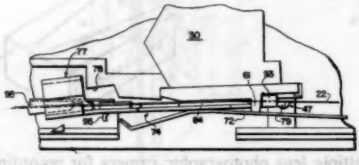
PHOTOGRAPHIC FILM CASSETTE HAVING AN IMPROVED FILM-ENGAGING PAD FOR FILM PROCESSING

Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 14, 1972, Ser. No. 262,654

Int. Cl. G03d 5/06

U.S. Cl. 95—89 R **20 Claims**



A photographic film cassette having a processing station configured to dispense processing fluid to the film strip following exposure of the latter includes a pressure pad member having a precision surface of minimum area configured to support incremental portions of the photographic film strip during the application of the fluid. Preferably, the processing station includes a nozzle having a film-engaging land which includes side portions extending from the nozzle opening in supporting engagement with the film margins during fluid application so as to thereby minimize fluctuations of film portions just subsequent to the application of the fluid, and the pressure pad includes a substantially U-shaped surface which generally conforms to the nozzle opening and its film engaging land.

3,748,995

PROCESS AND APPARATUS FOR DEVELOPING LIGHT-SENSITIVE MATERIAL

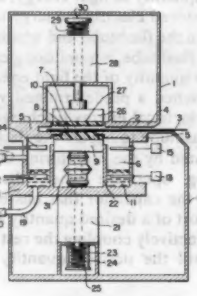
Herbert Schroter, Hahn, and Jochen Koblo, Wiesbaden, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden, Germany

Filed Sept. 7, 1972, Ser. No. 286,918

Claims priority, application Germany, Sept. 9, 1971, P 21 45 079.3

Int. Cl. G03d 7/00

U.S. Cl. 95—89 G **6 Claims**



A process and an apparatus for developing light-sensitive material. The apparatus comprises

a chamber member adapted to contain a developer and having an aperture in the top thereof,

a first plate adapted to seal said aperture,

a first mechanism for moving said first plate into and out of sealing engagement with said aperture,

a table on the top of said chamber,

a second plate mounted above said first plate and adapted to seal a light-sensitive material in said aperture,

and a second mechanism for moving said second plate into and out of sealing engagement.

3,748,996

WET DEVELOPING DEVICE FOR DIAZO TYPE COPYING MACHINES

Yugoro Kobayashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

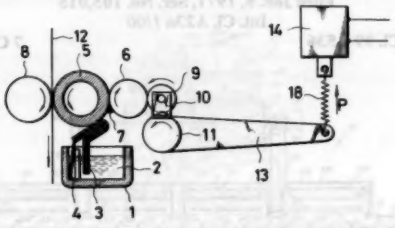
Filed Apr. 3, 1972, Ser. No. 240,458

Int. Cl. G03d 5/06

U.S. Cl. 95—89 A **10 Claims**

A wet developing device for copying machines of the diazo type comprising a transfer roller, a central roller and a pressing roller arranged in a row and abutting each other. The central roller is made of rubberlike material, and a felt strip whose lower portion is immersed in a tray of developing fluid, is pressed against the central roller by means of a leaf spring. As the rollers rotate, excess developing fluid applied to the central roller is squeezed between the pressing roller and the central roller, and a photosensitive sheet passed between the transfer roller and the central roller receives a minimal but uniformly distributed coating of developing fluid. The diame-

ter of the pressing roller is less than the diameter of the transfer roller such that the squeezing action between the pressing roller and the central roller is greater than the squeezing action between the central roller and a transfer roller, and hence no excess developing fluid collects at the area of contact between the transfer and the central rollers where the



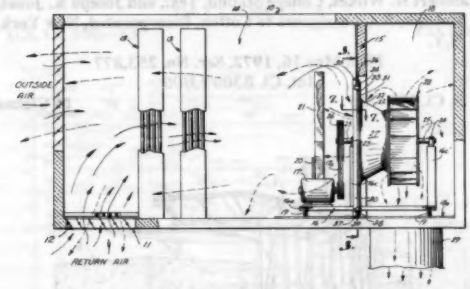
sheet to be developed is passed. A pressure applying roller maintains constant regulated pressure between the transfer, central and pressing rollers while the wet developing device is in operation, and removes the pressure when the wet developing device is not operating so as to avoid deformation of the central roller due to lasting pressure on the same areas of the central roller.

3,748,997

ACOUSTICAL INSULATED FAN AND TEMPERATURE CONDITIONING PENTHOUSE UNIT

Frank J. Dean, Jr., Kansas City, Mo., and James A. Reese, Overland Park, Kans., assignors to Tempmaster Corporation, Kansas City, Mo.

Filed Apr. 6, 1972, Ser. No. 241,567
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 **13 Claims**



A penthouse type air conditioning unit has an acoustically insulated fan which separates the fan motor from the fan discharge end portion by compartments within the unit. Each compartment is acoustically insulated with the discharge compartment being interconnectable with the conventional air conditioning ductwork. The fan impeller is mounted for exposed rotation without the use of the usual enclosure directional scroll and creates the pressure differential for conditioned air flow through the interconnected air ductwork. A target sound attenuator is mounted in the motor compartment at a preselected distance from the fan inlet to attenuate the predominant sound wave frequency generated by the fan.

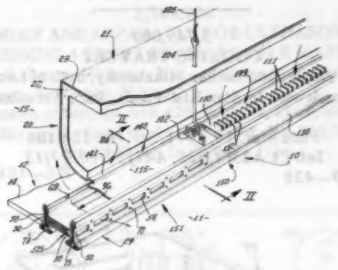
A second embodiment separates the fan motor and the fan impeller by an acoustical compartment which encloses the impeller and interconnects with air conditioning ductwork. A target sound attenuator is supported a preselected distance away from the fan inlet, said distance corresponding to the predominant sound wave frequency generated by the fan.

3,748,998

AIR BAR CONSTRUCTION FOR FIRE RESISTANT SUSPENDED CEILING

Robert R. Lambert, Glendora, Calif., assignor to Air Factors, Inc., Redlands, Calif.

Continuation of Ser. No. 58,251, July 27, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,186
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D **14 Claims**



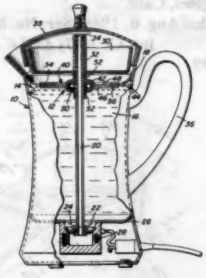
Inner and outer members of an inverted T-bar assembly are rolled from sheet metal, each including a vertical web with a horizontal flange extending from the lower edge and a side facing elongated opening in a head portion along the upper edge. The members are riveted together with the horizontal flanges aligned and oppositely extending with a cap therearound to give an inverted T-shape with the upper wall of the inner member extending into the opening of the outer member to engage the upper wall thereof while the upper wall of the outer member is spaced thereabove to form an inwardly opening elongated cavity. Pairs of spacer channels have tongues extending into slots in the lower wall of the inner members to space pairs of inverted T-bar assemblies to form an air bar. The lip of an air plenum chamber flange extends into the opposed T-bar assembly head cavities to mount the chamber over the air bar. In an alternative embodiment, the cooperating slots and tongues are replaced by troughs receiving the edges of the spacer channels.

3,748,999

AUTOMATIC DRIPOLATOR, SINGLE COMPARTMENT

James H. Beveretl, c/o Commonwealth-Tumpane Co. Ltd., Box 91 APO, New York, N.Y.

Continuation-in-part of Ser. No. 140,707, May 6, 1971, Pat. No. 3,696,733. This application Nov. 30, 1971, Ser. No. 203,322
Int. Cl. A47j *31/00*
U.S. Cl. 99—313 **13 Claims**



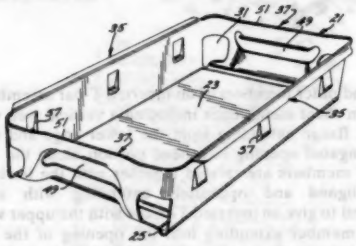
A non-recycling coffee maker incorporating a vertically sliding separator which divides a single compartment pot into segregated upper and lower chambers. The lower chamber receives the water which is pumped upwardly through a cen-

tral delivery tube for discharge downwardly through a coffee receiving basket into the upper chamber. The separator rides downwardly on the decreasing water level in the lower chamber, maintaining the separation of the chambers and simultaneously increasing the liquid capacity of the upper chamber for an accommodation of the brewed coffee. Elastomeric seals are provided between the separator and both the central delivery tube and the interior chamber wall with both seals being capable of flexing without such distortion as will allow the passage of liquid thereby.

3,749,000
COOKING TRAY SET

Frank V. Vidjak, and Lothar Mikalansky, both of Long Beach, Calif., assignors to Star-Kist Foods, Inc., Terminal Island, Calif.

Filed Mar. 15, 1971, Ser. No. 124,106
Int. Cl. A23l *1/325*; A47j *37/10, 27/13*
U.S. Cl. 99—425 **9 Claims**

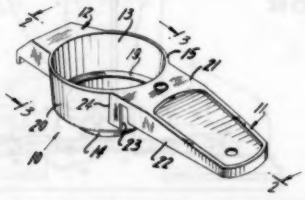


A set of cooking trays for cooking juicy foods such as tuna fish and including a plurality of tray bodies having bottom walls formed with respective raised central support sheets having recessed drain channels extending around the peripheries thereof for receipt of cooking juices drained from the respective sheets. Side walls surround the respective channels and are formed with outlets in their respective lower extremities for passage of cooking juices collected in such channels whereby the trays may be supported in vertically stacked relationship with the food supported on the sheets of the lower trays in a particular stack being disposed directly beneath the sheets of the respective upper trays of such stack to thereby protect such food from the cooking juices which collect in the respective channels and pour outwardly through the respective outlets during cooking of such food.

3,749,001
EGG SEPARATOR

James B. Swett, Barrington, R.I., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Aug. 6, 1969, Ser. No. 847,849
Int. Cl. A47j *43/14*
U.S. Cl. 99—499 **3 Claims**

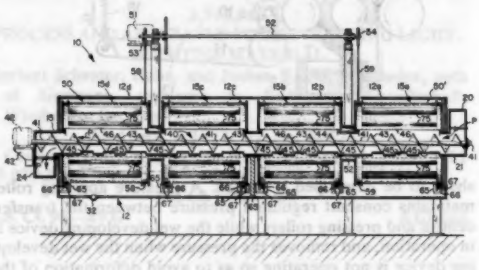


An egg separator having a handle reinforced with a downwardly extending flange. The flange is provided with a pair of mutually opposed slots which engage the edge of a bowl or cup permitting the separator to be suspended over the bowl or cup thus freeing the users hands.

3,749,002
COUNTER CURRENT POMACE WASHER

Radford L. Nowlin, 4124 S. Soderquist Rd., Turlock, Calif.

Filed Jan. 8, 1971, Ser. No. 105,015
Int. Cl. A23n *1/00*
U.S. Cl. 99—536 **7 Claims**

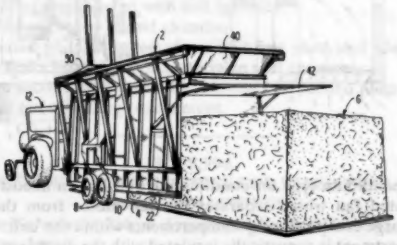


A counter current pomace washer comprising a screen reel. Along the inside of the screen reel are disposed screen lifters which are spaced apart radially at equal angular distances and which extend in a direction parallel to the axis of the reel. A screw conveyor is located along the axis of the reel so that the screen lifters through the rotating action of the reel transfer pomace to the screw conveyor. Counter flowing liquid washes the pomace on the screen reel to recover the usable ingredients of the pomace.

3,749,003
SEED COTTON HANDLING APPARATUS

Lambert H. Wilkes, College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Filed May 16, 1972, Ser. No. 253,877
Int. Cl. B30b *13/00*
U.S. Cl. 100—35 **16 Claims**



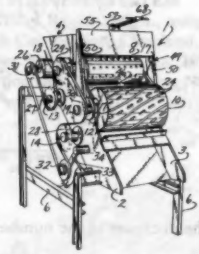
Apparatus and method are disclosed for temporarily storing cotton after harvesting. The apparatus includes a box frame which is open at the top and the bottom is closed by a pallet. The apparatus includes a carriage which is mounted for movement longitudinally along the top of the frame. The carriage includes a vertically reciprocating compaction head which serves the dual purpose of spreading the cotton horizontally in the frame and compressing the cotton against the pallet. The frame also has retractable wheels on opposite sides to raise the frame from the pallet, and to allow the frame to move longitudinally relative to the pallet. The compressed cotton on the pallet passes through a doorway in the rear of the frame as the frame advances.

3,749,004

APPARATUS FOR CRUSHING AND/OR COMPACTING

William G. Pagdin, Milwaukee, and Charles F. Constable, South Milwaukee, both of Wis., assignors to Jos. Schlitz, Brewing Company, Milwaukee, Wis.

Filed July 30, 1971, Ser. No. 167,648
Int. Cl. B30b *3/04, 15/14*
U.S. Cl. 100—50 38 Claims



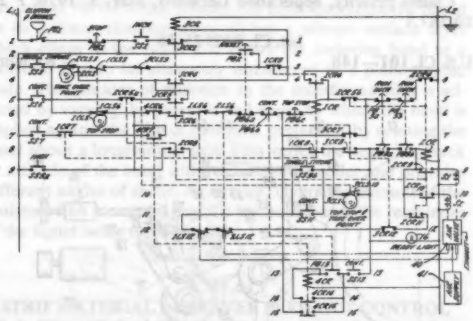
The disclosed machine or apparatus for crushing is of the general type having a plurality of sets or pairs of opposing crushing rollers arranged in series through which the materials for treatment are passed. One roller from each set of rollers is rotatably supported by a frame. The other roller from each set of rollers is rotatably supported by a member movable relative to the frame. The rollers supported by the movable member move with that member relative to the frame supported rollers to provide for relief from shock loading between the opposing rollers. Resilient means resist relative movement between the opposing rollers in the separating or shock relieving direction.

3,749,005

ELECTRICAL CONTROL SYSTEM FOR A POWER PRESS

Mathew F. Einecker, Hoffman Estates, and Kenneth R. Mahorney, Bartlett, both of Ill., assignors to Danly Machine Corporation, Chicago, Ill.

Filed Sept. 30, 1971, Ser. No. 185,186
Int. Cl. B30b *15/14*
U.S. Cl. 100—53 13 Claims



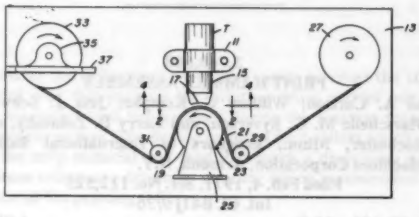
An electrical control system for a power press having three different modes of operation known as "inch," "single stroke," and "continuous." The control system incorporates numerous safety features, one of which is that two "run" buttons must be held depressed at all times during the "inch" mode, and during the major portion of the downstroke in the "single stroke" mode so as to avoid the possibility of attempted single-handed operation by the operator, which would leave one hand free to enter the path of the ram. In the "single stroke" mode, a malfunction of the relay which stops the press ram at the end of each cycle renders the reset circuit inoperative so that the malfunction must be corrected before press operation can be resumed. In the absence of a malfunction, the resetting is performed automatically. In the "continuous" mode, the "run" buttons must be held down during a major portion of the downstroke of the ram, and an additional button must be depressed during the first stroke of the ram in order to put the press into the "continuous" mode of operation. If the mode selector switch is turned from one mode position to another, the system must be reset so that any malfunctions will be detected, thereby preventing the operator from switching from one mode to another to circumvent the effect of a malfunction. Various other fail safe features, redundancies, and double redundancies are also included.

3,749,006

METHOD OF AND APPARATUS FOR ULTRASONICALLY EMBOSSING A SHEET OF MALLEABLE MATERIAL

Guenter H. Loose, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 858,428, Sept. 16, 1969, abandoned.
This application Feb. 16, 1972, Ser. No. 226,702
Int. Cl. B44b *5/00;* B44c *1/24*
U.S. Cl. 101—3 R 2 Claims



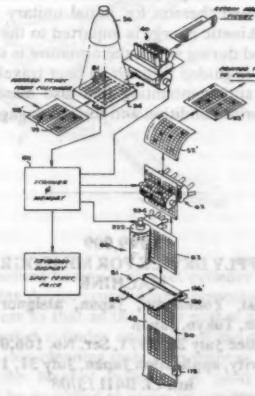
A sheet of malleable material such as photographic film or paper is placed over a projecting mark on an anvil, such as a number, and an ultrasonically vibrating horn is placed against the opposite side of the sheet. The sheet can be a continuously moving web, and the anvil can be a cylinder which rotates as the web passes in contact therewith, with the mark being periodically brought into register with the horn. Indexing mechanism can be provided to change the mark with each revolution of the anvil.

3,749,007

KENO TICKET PRINTER

Frank L. Kagele, Reno, Nev.; Lavern H. Meyers, Newport Beach, Calif., and Edward J. Trent, Reno, Nev., assignors to Intercontinental Services, Inc., Sparks, Nev.

Filed Nov. 16, 1971, Ser. No. 199,209
Int. Cl. B41j *9/02, 9/38*
U.S. Cl. 101—93 C 13 Claims



A system is disclosed for expediting and monitoring customer transactions in the game of keno including a plurali-

ty of transaction terminals or stations each including scanner means for sensing marked number spots of a customer marked keno ticket, a manually operable keyboard for receiving entries of the price of a transaction and the nature of the transaction and a duplicate receipt ticket providing means including printing means controlled by the scanner and the keyboard for rapidly providing a duplicate ticket with brush mark replicas in the same number spots as those of the customer marked ticket and for also imprinting additional information such as the nature and price of the transaction. Another aspect of the invention resides in the provision of a control and data processing system interconnecting the plurality of terminal stations to a central control for controlling and monitoring all of the transaction terminals and storing all transactions of all transaction terminals. An additional feature resides in the provision of a back printer for imprinting the back of a customer marked ticket with all information, such as the amount of the transaction and the nature of the transaction, imprinted on the receipt ticket.

3,749,008

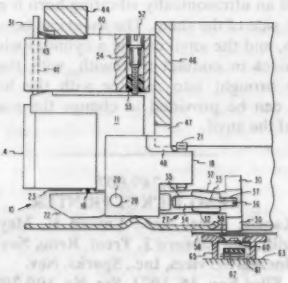
PRINT HAMMER ASSEMBLY

John A. Carlson; William G. Kempke; Jess J. Schweihs; Marschelle M. G. Syverson, and Larry D. Zolnosky, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,525

Int. Cl. B41j *9/36*

U.S. Cl. 101—93 C **4 Claims**



A print hammer assembly is provided for a high speed impact printer wherein a pivoted armature is utilized with a print hammer mounted thereon for initial unitary pivotal motion during which kinetic energy is imparted to the hammer and a terminal period during which the armature is stopped and the print hammer is guided through an over traveled print stroke by a parallel spring mounting that also biases the hammer away from a print condition and toward engagement with the armature.

3,749,009

INK SUPPLY DEVICE FOR MIMEOGRAPHING MACHINE

Minoru Suzuki, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

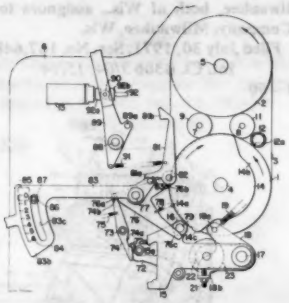
Filed July 26, 1971, Ser. No. 166,077

Claims priority, application Japan, July 31, 1970, 45/67579

Int. Cl. B41l *13/08*

U.S. Cl. 101—122 **7 Claims**

An ink supply device, for a mimeographing machine, mechanically detects the decrease in the number of copy sheets in a stack and which takes place as printing progresses, and supplies an optimum quantity of ink to a printing cylinder



in proportion to the decrease in the number of copy sheets in the stack.

3,749,010

RIGIDIZED PRINTING SCREEN

Pat F. Mentone, St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Nov. 12, 1971, Ser. No. 198,396

Int. Cl. B41n *1/24*

U.S. Cl. 101—127 **1 Claim**

An improved process for rigidized screen for printing and the like in which the frame is zincated prior to rigidizing the screen by encapsulating the screen in nickel.

3,749,011

DAMPING DEVICE FOR LITHOGRAPHIC PRINTING PRESSES

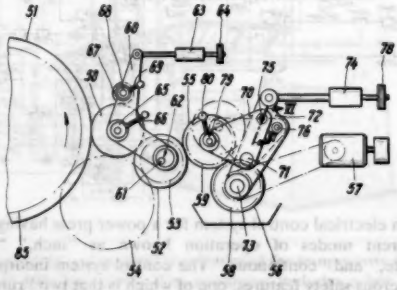
Paul Abendroth; Hans Alix, both of Offenbach; Friedrich Preuss, Neu-Isenburg, and Fred Kunkel, Offenbach, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach, Germany

Filed Feb. 26, 1971, Ser. No. 119,114

Claims priority, application Germany, Mar. 5, 1970, P 20 10 387.1

Int. Cl. B41l *25/16*

U.S. Cl. 101—148 **8 Claims**



A damping device for lithographic printing presses comprises a train of four rollers formed by a damping roller to engage the press plate cylinder and a distributing roller which in turn engages an intermediate roller in rolling contact with a fountain roller dipping in a damping solution container. The distributing roller and the fountain roller are both mounted on fixed axes, the other two rollers in the train having their axes on pivoted levers so that they can be brought into and out of engagement with each of the two rollers they respectively

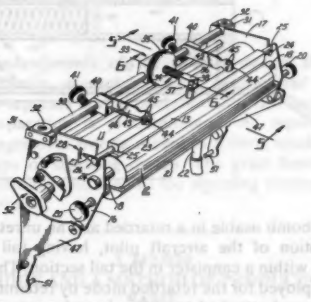
engage during operation of the press. The intermediate and damping roller mountings also include provision for adjustment of the inter-axial distance of the rollers. Movement of the rollers between engaged and disengaged positions may be manual or automatic.

3,749,012

MOISTURE DISPENSING UNIT FOR LITHOGRAPHIC FOUNTAIN SYSTEM

Francis K. Luke, Grand Rapids, Mich., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 35,640, May 8, 1970, abandoned.
This application Oct. 20, 1971, Ser. No. 190,848
Int. Cl. B41f 7/26
U.S. Cl. 101—148 1 Claim



A moisture dispensing unit is provided for use in a roller train supplying fountain solution to a planographic plate of a lithographic printing press. The unit is designed to provide a film of moisture that can be easily controlled as to quantity to meet press requirements of relatively wet or relatively dry to intermediate conditions.

In one form, the unit comprises a hard surfaced, hydrophilic roller rotating in a pan of fluid, to carry an unspecified quantity of liquid on its surface from the pan. A moisture-metering elastomeric band extends axially of the roller for substantially the length of the roller and is backed by a reinforcing metal bar or rod. As the roller rotates, the band intercepts the liquid on its surface, shearing away all but a minute surface layer which clings to the roller and clears the metering band as a moisture film to be ultimately transferred to a planographic plate. The amount of moisture in the transferred film is adjusted by varying the pressure and angle by which the band is applied against the film of moisture, preferably by rotating the band about a longitudinal axis. This varies the angle of attack or attitude of the band with respect to the roller and provides different angles of shear. As a result, a variable amount of the moisture film is emitted past the metering band, the remainder of the liquid being turned back.

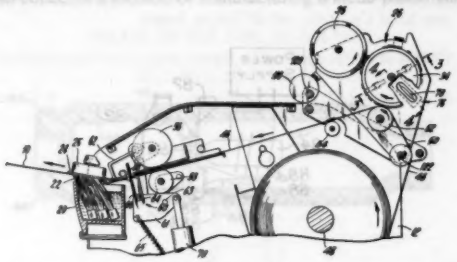
3,749,013

STRIP MATERIAL DISPENSER FEED-OUT CONTROL

Edwin Ellner, Oxford, Conn., assignor to Better Packages, Inc., Shelton, Conn.

Filed May 17, 1971, Ser. No. 144,151
Int. Cl. B41l 15/14
U.S. Cl. 101—227 1 Claim

A device for controlling the length of feed-out of strip material and for regulating the cut-off of the strip material in accordance with the printing of information thereon includes a printing cylinder or drum which engages the strip material as it is fed and imprints it with legend or code. The drum is arranged to rotate in engagement with the surface of the strip material and to transfer an impression thereon during the rotation. Means are associated with the drum for regularly energizing switch means to stop the feed of the strip material and to actuate or permit a cutting device or knife to sever the strip material in lengths corresponding to the desired length as set by the impression printed thereon by rotation of the printing roller. The knife is advantageously actuated and the feed rollers are disengaged by a solenoid which is controlled by a switch operated by rotation of the drum and which is deenergized to permit the movement of the knife through a cutting



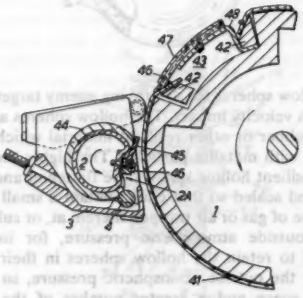
path under the influence of a return spring to sever the strip material. For this purpose the printing drum carries one or more magnets which trip a switch during the rotation thereof by magnetic action. The device includes feed rollers which engage the strip material and feed it through a dispensing path and these rollers are driven by a motor which is controlled by rotation of the printing roller.

3,749,014

PRINTING MACHINE BLANKET CYLINDER CLEANING DEVICE

Albert George Ronald Gates, London, England, assignor to Gestetner Limited, London, England

Filed Feb. 3, 1971, Ser. No. 112,381
Claims priority, application Great Britain, Feb. 7, 1970, 5,455/70
Int. Cl. B41f 35/06
U.S. Cl. 101—425 6 Claims



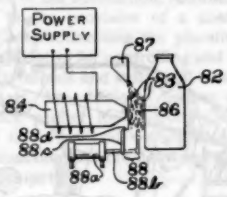
A printing machine having a blanket cylinder which has an improved cleaning device comprising a cleaning roller with a longitudinal recess so that as the roller makes a revolution it contacts the blanket cylinder only part of the time, and can thus be brought into cleaning operation without bodily movement towards the blanket cylinder. A pawl and ratchet mechanism may be provided to cause intermittent rotation of the cleaning roller, automatically stopping at the end of a cleaning cycle.

3,749,015

APPARATUS AND PROCESS FOR PRINTING

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Division of Ser. No. 506,960, Nov. 9, 1965, Pat. No. 3,526,708.
This application Aug. 28, 1970, Ser. No. 67,839
Int. Cl. B41f 35/00
U.S. Cl. 101—426 14 Claims



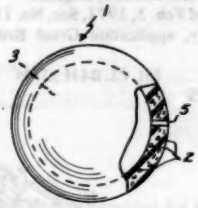
A printing method and apparatus employs a high frequency magnetic through-field of high strength for effecting permanent lodging of pulverized magnetic particles on ordinary paper in a simple one-step operation. The strength of the magnetic field is several times the value required for simple transfer deposit of magnetic particles. The field is concentrated by use of an edged field plate to facilitate providing the desired field strength. Numerous embodiments for practicing the invention are disclosed.

3,749,016

FLEXIBLE HOLLOW SPHERES

Joseph Hershkowitz, West Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 24, 1968, Ser. No. 786,781
Int. Cl. F42b 13/00
U.S. Cl. 102—1 R 10 Claims



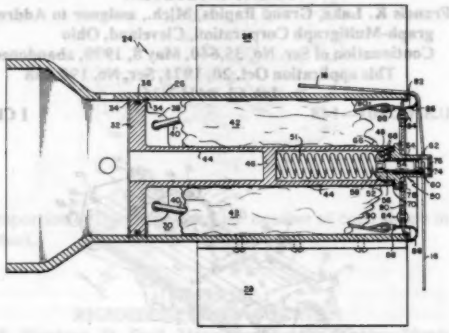
Lethal hollow spheres for destroying enemy targets in outer space by high velocity impact. The hollow spheres are formed of resilient rubber or other resilient material which is highly impregnated with metallic particles. The highly metallic impregnated resilient hollow spheres are flattened and partially evacuated and sealed so that each contain a small predetermined volume of gas or air trapped therein at, or substantially at, normal outside atmospheric pressure, for instance at ground level to retain the hollow spheres in their flattened condition by the outside atmospheric pressure, so that they occupy less space and a greater number of the flattened spheres can be packed in a delivery container, such as a rocket, or shell, for subsequent projection toward a selected target in rarefied air, or in the absence of surrounding atmosphere. As the spheres are projected through space or rarefield are toward a target or satellite the relative increase in pressure of the expanding gas or air trapped in the spheres, because of reduction or lack of outside surrounding atmospheric pressures, cause the flattened hollow spheres to expand outwardly to their initial full spherical shape, when discharged from their delivery container for lethal impact with the selected target or satellite in space.

3,749,017

PARACHUTE RETARDING TAIL ASSEMBLY FOR BOMB

Carl R. Peterson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1971, Ser. No. 205,534
Int. Cl. F42b 25/02
U.S. Cl. 102—4 4 Claims



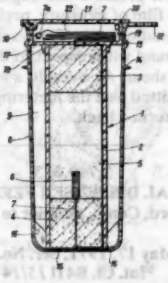
A drop bomb usable in a retarded and an unretarded mode at the option of the aircraft pilot, having tail fins and a parachute within a cannister in the tail section. The parachute may be deployed for the retarded mode by retaining at the aircraft a lanyard attached to an arming wire associated with a ball lock release mechanism which holds a spring loaded cover on the parachute cannister. For the unretarded deployment, the lanyard is not retained at the aircraft, but falls with the bomb and the ball lock mechanism is not activated.

3,749,018

DETONATION PRODUCING AMMUNITION

Raimund Germershausen, Dusseldorf, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Oct. 22, 1969, Ser. No. 868,497
Claims priority, application Germany, Nov. 7, 1968, P 18 07 527.9
Int. Cl. C06d 1/06
U.S. Cl. 102—33 6 Claims



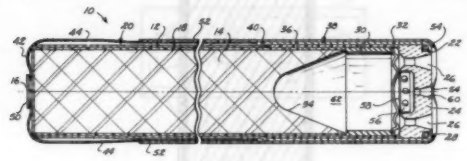
A detonation producing ammunition which comprises a discharging cup and a detonation body which is ignitable in the discharging cup. A bucket-shaped container of synthetic material is arranged which receives the detonation body jolt-free and closeable. The container is secured relative to the detonation body and the discharging cup surrounds the container such, to form during and after the firing of the detonation body a lining protecting the discharging cup and remaining unimpaired, and the lining is easily removable.

3,749,019

ROCKET-POWERED SIGNALING DEVICE

Earl A. Hancock, 12828 Great Oak Ln., Clifton, Va., and James R. MacPherson, 2401 Claremont Dr., Falls Church, Va.

Filed Sept. 8, 1971, Ser. No. 178,580
Int. Cl. F42b *13/38*
U.S. Cl. 102—34.4 10 Claims



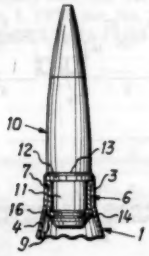
In the embodiments of the subject device shown and described herein, a rocket casing is disclosed which is designed to separate during operation into two sections. The point of separation is predetermined. At separation, the device changes over from a rocket to a flare, smoke marker, or other type of signaling means. The grain functions as a propellant initially and then as the signaling means following casing separation.

3,749,020

CARTRIDGE AND A METHOD OF PRODUCING THE SAME

Rolf Weyhmuller, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Aug. 30, 1971, Ser. No. 176,060
Claims priority, application Switzerland, Sept. 8, 1970, 13361/70
Int. Cl. F42b *31/00, 13/16*
U.S. Cl. 102—38 8 Claims



A cartridge comprising a projectile and a cartridge case is formed with a neck at its forward end, and a sleeve-shaped holder for the projectile inserted into the mouth of the neck. A portion of the holder which is conically expanded by the insertion of the projectile bears against the inside of the neck of the cartridge case.

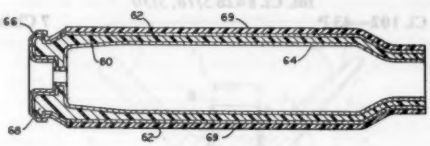
3,749,021

METAL COATED PLASTIC CARTRIDGE CASE AND METHOD OF MANUFACTURE

Lester E. Burgess, Swarthmore, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Dec. 18, 1970, Ser. No. 99,495
Int. Cl. F42b *5/30*
U.S. Cl. 102—43 P 5 Claims

A metal-plated plastic cartridge case. A film of metal, preferably between 0.05 to 0.1 mils thick is plated onto a plastic cartridge case to increase the strength of the case and to provide it with other favorable characteristics such as abrasion and burn-through resistance and lubricity. The plastic case may comprise a filled or a fiber reinforced plastic. A plated metal skin preferably 5 to 7 mils thick may also be employed in conjunction with non-reinforced plastic cases to increase the strength of the case in critical areas. The invention also concerns a method of manufacturing a metal-plated cartridge case wherein a thermo plastic resin combined with a two-stage thermosetting resin and molded into a cartridge case blank, taking care not to achieve a permanent set. The blank is then molded into a cartridge case, preferably by compressing the extractor area and blow-molding the remainder of the cartridge case. Alternatively, the blank may be formed by extrusion or resin solvent solution impregnation of a sleeve reinforcement. In either case, the finished molded cartridge case is then metal plated to the required thickness of metal.

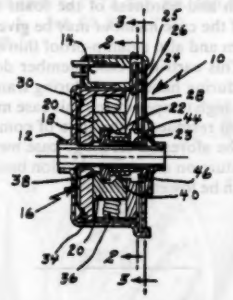


3,749,022

TWO-STAGE ARMING MECHANISM

Charles W. Lindberg, Minnetonka, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1971, Ser. No. 189,284
Int. Cl. F42c *15/22*
U.S. Cl. 102—79 6 Claims



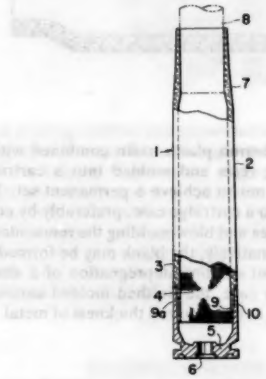
A two-stage arming mechanism for a spin-to-arm munition. This arming mechanism contains two arming means therein which must be activated in sequence in order to fully arm the mechanism. The first means is actuated by spin velocity, while the second means is activated by angular deceleration which occurs during ground impact. Unless both conditions are met in the proper sequence the arming mechanism will not fully arm.

3,749,023

INSTANTANEOUSLY COMPLETELY COMBUSTIBLE CARTRIDGE CASE MEMBER OF POLYVINYL ACETAL

Kunihiko Kawaguchi, Tokyo; Kenji Takahashi, Sashima; Hidemichi Kazama, Yokohama; Mitsuzo Ono, Sahima; Hisao Yamazaki, Tokyo; Yoshimitsu Takeda, Yokohama, all of Japan, assignors to Technical Research and Development Institute; Kanegafuchi Boseki Kabushiki Kaisha, and Nippon Koki Co., Ltd., all of Tokyo, Japan

Filed July 16, 1971, Ser. No. 163,287
Claims priority, application Japan, July 23, 1970, 45/63913
Int. Cl. F42b *5/18, 5/30*
U.S. Cl. 102—43 P 7 Claims



By first radially compression-molding a hollow cylindrical foam of a synthetic resin such as polyvinyl acetal, polyurethane and polystyrene in a mold utilizing a pressurized fluid and then by expanding the compressed foam with heat — after moistening it — in a heat-expansion mold, an instantaneously completely combustible cartridge case member is obtained. By the inclusion in the foam of at least one kind of reinforcement filler selected from two groups, i.e., fibers of the said resins and a cloth of said resins, prior to being compressed, the said foam can have an increased strength. By also including a binder of a synthetic resin after compression, further increased strength and hardness of the foam is obtained. The outer surface of the case member may be given an easily combustible thin film and also a damp-proof thin coating on top of the said film. This cartridge case member does not combust spontaneously during handling or during transportation since it combusts at a high temperature. This case member leaves no solid combustion residues at the time of combustion within a firearm. Also, the aforesaid cartridge case members are suitable for manufacture on a mass production basis and the cost of manufacture can be lowered greatly.

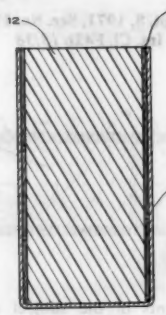
3,749,024

OUTGASSING TECHNIQUE

Jack M. Pakulak, Jr., China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1971, Ser. No. 137,557
Int. Cl. F42b *1/00, 25/00, 3/00*
U.S. Cl. 102—101 5 Claims

An outgassing technique which comprises providing a chemical liner for a casing or container which will decompose into a gas with sufficient pressure to rupture the casing when



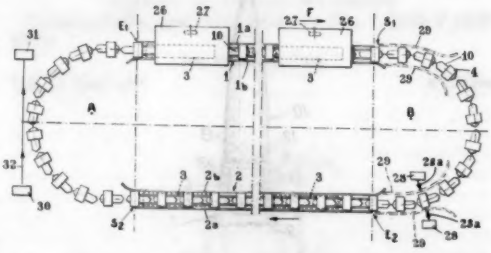
the container is subjected to a high heat source. This allows release of any material within the container.

3,749,025

ENDLESS-CHAIN CONVEYOR, PARTICULARLY FOR TRANSPORTING INDEPENDENT CARS

Francois L. Giraud, Plaisir, France, assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Oct. 26, 1971, Ser. No. 192,433
Claims priority, application France, Dec. 15, 1970, 7045238
Int. Cl. B65g *17/06*
U.S. Cl. 104—25 12 Claims



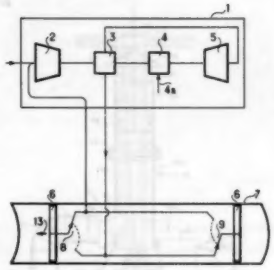
An endless-chain conveyor for use on a track at least one section of which is provided with longitudinally aligned, fixed inductors of an electric, linear-induction motor, the conveyor having a plurality of longitudinally spaced platforms supportable on longitudinal support and guide rails at opposite sides of the inductors, adjacent platforms being pivotally connected to one another by links for pivotal movement about vertically spaced axes. An armature is connected to each platform and has a lower, planar surface which is adapted to extend parallel and slightly above the upper, horizontal faces of the fixed inductors. Guide shoes yieldably connected to the platforms engage the guide rails. The armatures may comprise rigid frames, preferably of non-magnetic, conductive material, having downwardly opening recesses in which are held bodies of magnetic substance, which bodies may be magnetic particles bound by an electrically non-conducting adhesive, and transverse conductors embedded in the bodies.

3,749,026

VEHICLE PROPULSION SYSTEM

Jean Carrasse, Antony, France, assignor to Societe Generale De Constructions Electriques Et Mecaniques (Alsthom), Paris, France

Filed Nov. 18, 1970, Ser. No. 90,643
Int. Cl. B61b 13/10
U.S. Cl. 104—156 10 Claims



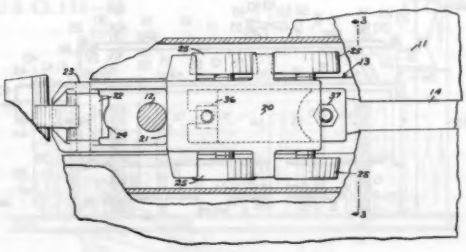
To propel a vehicle along a way, a source of highly compressed gas is provided, for example a turbine generator, which is introduced into a gas tight housing, such as a cylinder, extending along the way of the vehicle. The gas is introduced into the cylinder ahead of a reaction piston secured to the vehicle, with slides in the gas tight housing. The gas tight housing is closed off by means of a flexible rubber strip which is deflected by a holding bar interconnecting the vehicle and the piston as the vehicle travels along the way, and the gas tight housing. Preferably, from time to time, closing shields are placed within the gas tight housing, opening just before the vehicle arrives and closing thereafter.

3,749,027

SUBFLOOR CONVEYOR SYSTEMS

Ralph W. Adler, Utica; Albert Goldstein, Southfield, and Robert Haase, Troy, all of Mich., assignors to American Chain & Cable Company Inc., New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,323
Int. Cl. B61b 13/00
U.S. Cl. 104—172 BT 17 Claims



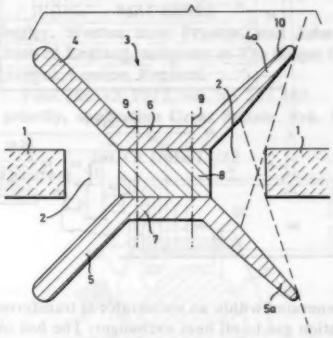
A subfloor conveyor system comprising a chain mounted for movement beneath the slot of a floor and a plurality of longitudinally spaced trolleys mounted on the chain and engaging the track. Each trolley has a surface adapted to be engaged by a tow pin of a carrier movable along the floor. Each trolley comprises a body which has an opening at one end and a slot at the other that engage respective longitudinally spaced vertical projections on the chain. The configuration of the body adjacent the slot is such as to facilitate assembly of the trolley body to the carrier and disassembly for repair without removing the chain from its position in the floor.

3,749,028

BULLETPROOF BAFFLE ARRANGEMENT

Gustav Lorenz Strobl, Hardtstr. 2, 5 Cologne-Klettenberg, Germany

Filed Jan. 26, 1972, Ser. No. 220,804
Claims priority, application Germany, Jan. 26, 1971, P 21 03 357.8
Int. Cl. E06b 7/30
U.S. Cl. 109—21.5 14 Claims



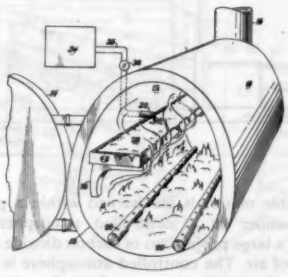
A bulletproof baffle member for use within the opening of a bulletproof window or enclosure comprising at least one pair of baffle elements joined to one another to form a symmetrical obliquely shaped arrangement with respect to the plane of the window and including a core material intermediate to the elements to retain and trap a deflected bullet or projectile. Various arrangements and configurations of the intermediate section and core member are provided.

3,749,029

LIQUID INCINERATOR

Lubertus Bakker, and Eugene D. Krumm, both of Wellsville, N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed June 6, 1972, Ser. No. 260,233
Int. Cl. F23g 7/00
U.S. Cl. 110—7 R 8 Claims



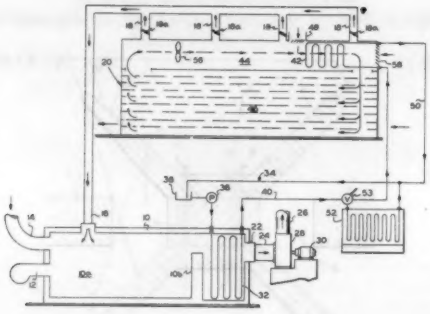
An arrangement by which a conventional "starved-air" type waste incinerator for solid waste may be adapted to burn liquids or sludge type materials alone or in combination with the solid waste.

3,749,030

HEATING AND EXHAUST EMISSION CONTROL SYSTEM AND METHOD FOR MATERIAL DRYERS

Roy B. Burden, Jr., Sherwood, and Ernest J. O'Gieblyn, Portland, both of Oreg., assignors to Wasteco, Inc., Tualatin, Oreg.

Filed Nov. 8, 1971, Ser. No. 196,506
Int. Cl. F23g 7/00
U.S. Cl. 110—8 R 2 Claims



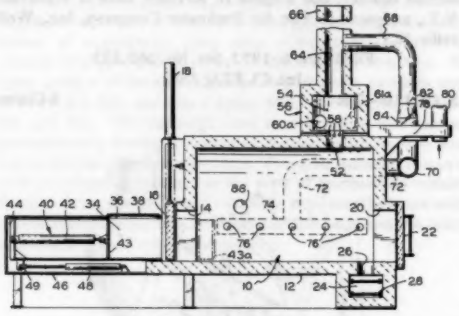
Heat generated within an incinerator is transferred to oil in a combustion gas-to-oil heat exchanger. The hot oil is circulated through a radiator in a material dryer to heat air used as the drying medium. The hot air passing in contact with the material to be dried picks up particulate solids and gases which heretofore have been exhausted to atmosphere. These gas-borne waste emissions are, in accordance with the invention, confined and conducted to the combustion chamber of the incinerator where they are burned, thus becoming a source of heat for the dryer.

3,749,031

CONTROLLED ATMOSPHERE INCINERATOR

Roy B. Burden, Jr., Sherwood, Oreg., assignor to Wasteco, Inc., Tualatin, Oreg.

Filed Nov. 8, 1971, Ser. No. 196,507
Int. Cl. F23g 5/12
U.S. Cl. 110—8 R 15 Claims



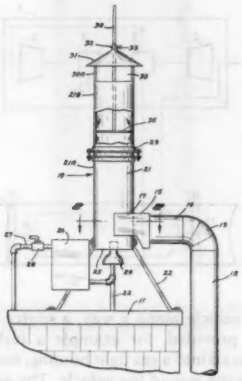
Combustible materials are burned within a primary combustion chamber in a controlled atmosphere consisting primarily of a large proportion of carbon dioxide and a smaller proportion of air. The controlled atmosphere is produced by afterburning the combustion gases from the primary burner in the presence of combustion air and then recirculating the hot afterburned gases mixed with controlled amounts of air back to the primary combustion chamber. By controlling the proportionate amounts of carbon dioxide and air in the mixture, the temperature and rate of burning in the primary chamber can be carefully regulated.

3,749,032

SMOKE CONTROL DEVICE

Merlin W. Ehrlichmann, Minnetonka, and John R. Bjorklund, Jr., New Hope, both of Minn., assignors to West Creek Co., Inc., Minnetonka, Minn.

Filed Apr. 24, 1972, Ser. No. 246,806
Int. Cl. F23g 5/12
U.S. Cl. 110—8 A 7 Claims



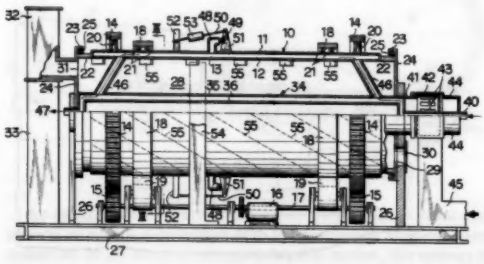
An antipollution or smoke control device comprising an afterburner for the output of an incinerator that has means controlling combustion to meet pollution control standards of the various pollution control agencies.

3,749,033

ROTARY KILN INCINERATOR

Kumakichi Sugano, 34-6, 3-chome, Asakusabashi, Daito-ku, Tokyo, and Kenichi Matsumura, 946, 2-chome, Shimo-ochiai, Shinjuku-ku, Tokyo, both of Japan

Filed Dec. 30, 1971, Ser. No. 214,063
Claims priority, application Japan, Dec. 30, 1971, 45/128588
Int. Cl. F23g 5/06
U.S. Cl. 110—10 8 Claims



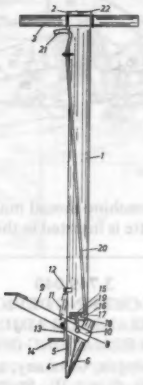
An incinerator comprising a horizontally extending rotary kiln having a cooling water jacket between its inner and outer walls. An inner drum extends axially through the rotary kiln to define an annular combustion chamber therein, the inner drum including a water conduit in communication with the cooling water jacket and a plurality of air channels to supply air into the combustion chamber. On the circumference of the rotary kiln there are mounted a plurality of gear wheels respectively in mesh with pinions coupled to a motor for rotating the kiln. The kiln has a plurality of raised circular rims on its circumference each resting on a pair of rollers for further support.

3,749,034

PLANTING TOOL FOR SEEDLINGS

Mikko Hannu Tapani Bergius, Lansi-Sakyla; Tapio Heikki Saarenketo, Ilvespolku 20, 96400 Rovaniemi 40, and Altti Kalervo Keskilohko, Lansi-Sakyla, all of Finland

Filed Mar. 8, 1972, Ser. No. 232,847
Claims priority, application Finland, Mar. 11, 1971, 706/71
Int. Cl. A01c *11/00*
U.S. Cl. 111—4 3 Claims



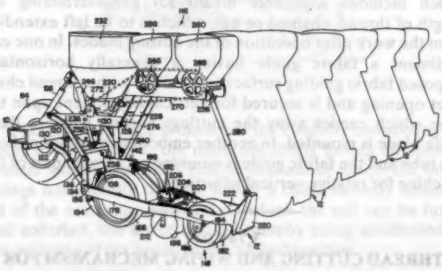
A planting tool for seedlings consisting of a shaft in the form of a pipe, having a handle at the upper end thereof, and a pair of blades at the lower end, in the nature of jaws, one of the jaws being fixed and the others being pivotally mounted, and having a foot pedal affixed thereto. A lever is associated with the pipe, with handle means at its upper end, near the handle at the top of the pipe, whereby seeds may be selectively planted in the ground at a predetermined depth, through coordinated manipulation of the pivotably jaw, and the seed lever.

3,749,035

PRECISION DEPTH SEED PLANTER

David Walter Cayton, Cupertino, Calif., and Leslie William Johnson, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Dec. 28, 1970, Ser. No. 101,916
Int. Cl. A01c *5/00*
U.S. Cl. 111—85 17 Claims



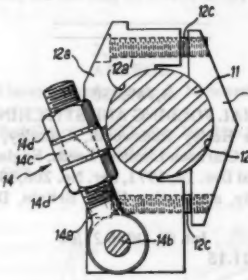
A precision depth planter including a plurality of furrow-forming units mounted on a main frame for relative vertical movement, each unit including a pair of depth gauge wheels for carrying the unit and for regulating the depth of the furrow formed thereby. A seed dispensing unit is mounted on the main frame directly above each furrow-forming unit and includes a seed container and selecting mechanism for delivering seeds to the furrow, the several selecting mechanisms being commonly driven from a drive shaft extending transversely between the dispensing units. A separate hydraulic cylinder acts on each furrow-forming unit to maintain a constant force on said unit regardless of the position thereof relative to the main frame. A ground-engaging sensing unit mounted on the planter frame measures soil hardness and in conjunction with a hydraulic control valve acts to vary the force exerted by the hydraulic cylinders to maintain a uniform planting depth irrespective of variations in soil hardness.

3,749,036

HOOK BAR ADJUSTMENT MEANS FOR TUFTING MACHINES

Harry Priestley, Warton near Preston, and John Higgins, Wigan, both of England, assignors to The Singer Company, (U.K.) Limited, London, England

Filed Jan. 13, 1972, Ser. No. 217,482
Claims priority, application Great Britain, Feb. 18, 1971, 4,896/71
Int. Cl. D05c *15/22*
U.S. Cl. 112—79 R 5 Claims



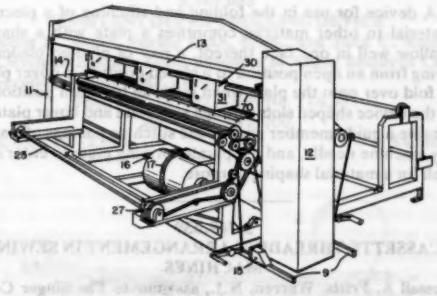
A looper shaft assembly for a tufting machine is provided with an adjustment means for varying the angularity of the looper bar relative to the looper shaft, the adjustment means including a screw carried by the looper bar mounting bracket and cooperating with a lug secured to the looper shaft.

3,749,037

DUAL HEAD FOR A MULTI-NEEDLE SEWING MACHINE

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed Dec. 22, 1971, Ser. No. 210,903
Int. Cl. D05b *11/00*
U.S. Cl. 112—117 9 Claims



A dual head for a multi-needle machine of the type sewing a series of long (straight or zigzag) lines of stitching into an elongate sheet of bedding material passing through the machine, comprising: A. a box frame; B. frame-mounted first and second dual sewing machine heads; and C. a common means for positively driving said dual heads in a substantially fixed phase relationship.

The dual sewing heads, on opposite sides of a transverse separating plane passing vertically through the box frame, comprise: (1) first and second multi-needle bars for carrying first and second successions of sewing needles; (2) first and second means for positively reciprocating the multi-needle bars vertically; (3) first and second presser-foot bars for carrying first and second successions of presser feet; (4) first and second means for positively reciprocating the presser-foot bars vertically; (5) first and second thread pull levers; and (6) first and second means for oscillating the thread pull levers.

By reversely operating the first and second dual heads in 180° out-of-phase relationship, the vibrations of one head are counterbalanced by the vibrations of the other head to such an extent that it is possible to increase the operating speed in substantial measure. By positively driving each head from a common drive, they move in a fixed phase relationship so that identical sewing and presser foot operations are obtained and sewing speed, stitch-length and other related variations between heads thereby eliminated. By adjusting the angular position of the thread pull lever one way or the other, its thread pulling function can be advanced or retarded.

3,749,038

MATERIAL FOLDING AND STITCHING AID

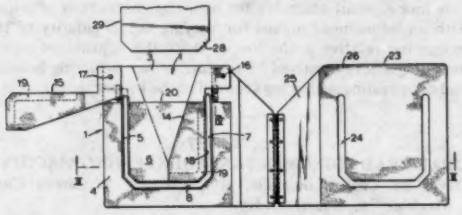
Alfred Manston Heeley Dodsworth, Guiseley, England, assignor to W. J. Clarkson Limited, Leeds, England

Filed Dec. 14, 1971, Ser. No. 208,005

Claims priority, application Great Britain, Dec. 30, 1970, 61,801/70

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **7 Claims**



A device for use in the folding and stitching of a piece of material to other material comprises a plate with a shaped shallow well in one face thereof, a pair of pivoted blades to swing from an open position to a closed position, a cover plate to fold over onto the plate when material has been positioned in the device shaped slots through said plate and cover plate to receive a guide member and for the stitching passage of a sewing machine needle, and a separate forming plate to enter said well for a material shaping purpose.

3,749,039

CASSETTE THREADING ARRANGEMENT IN SEWING MACHINES

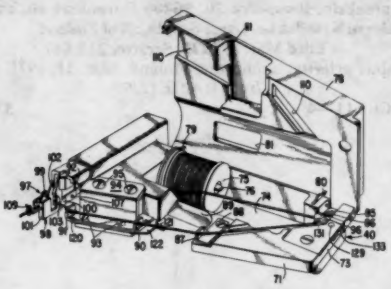
Russell A. Fritts, Warren, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 300,014

Int. Cl. D05b *43/00*

U.S. Cl. 112—218 R **8 Claims**

A sewing machine is disclosed in which the needle thread manipulating instrumentalities including a thread tensioning device, a check spring, and a thread take-up member may be threaded by the act of inserting into the machine a cassette including a supply of thread with provision for guiding and positioning the thread from the supply for introduction of the



thread to the sewing machine thread manipulating instrumentalities when the cassette is inserted in the sewing machine.

3,749,040

THREAD-CHAIN CUTTING DEVICE FOR SEWING MACHINES WITH MEANS FOR ADJUSTING LENGTH OF THREAD REMAINING ON WORK

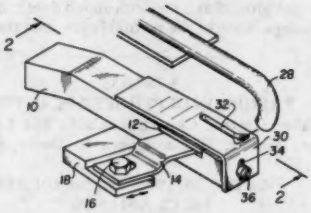
Erwin Jurgens, Hemmingen, Germany, assignor to Union Special Maschinenfabrik G.m.b.H., Stuttgart, Wuerttemberg, Germany

Filed Apr. 26, 1971, Ser. No. 137,327

Claims priority, application Germany, May 2, 1970, P 20 21 649.3

Int. Cl. D05b *65/00*

U.S. Cl. 112—252 **1 Claim**



Thread chain cutting mechanism for sewing machines which includes adjustable means for predetermining the length of thread, chained or not, which is to be left extending from the work after operation of the cutting blades. In one embodiment a fabric guide having a generally horizontally disposed fabric guiding surface is provided with a thread chain inlet opening and is secured for vertical adjustment upon the tube which carries away the cuttings and on which a fixed knife blade is mounted. In another embodiment either or both the tube and the fabric guide is mounted on a frame part of the machine for relative vertical adjustment.

3,749,041

THREAD CUTTING AND WIPING MECHANISM FOR GROUP STITCH SEWING MACHINE

Richard E. Bowin, Berkeley, Calif., assignor to Union Special Machine Company, Chicago, Ill.

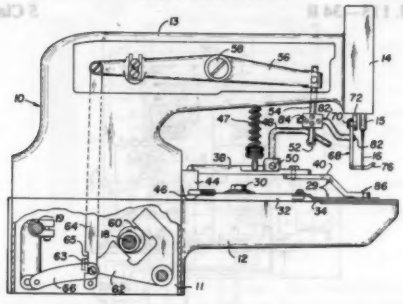
Filed Dec. 1, 1971, Ser. No. 203,632

Int. Cl. D05b *65/06*

U.S. Cl. 112—252 **10 Claims**

Group stitch sewing machine equipped to form tacks made of single thread chain (type 101) stitches. A thread severing blade is fixed in the needle receiving aperture of the tacking clamp and is provided with a gravity actuated sheath to expose cutting edge of knife only when tacking clamp starts to rise to

open position at end of each group stitching operation. Thread extending over blade is severed to leave upwardly protruding thread tail extending from tack by which tack may be readily stripped from work after tack has served intended purpose. Thread wiper is provided to cooperate with conventional thread take up mechanism to remove other severed end of thread from the work piece and to position severed end for initiation of next group stitching operation. Thread wiper is freely pivoted and is actuated by contact of cam surfaces thereon with rigid rod fixed to and movable with clamp opening means. Action of wiper is initiated by opening movement of clamp and major portion of remaining movement of wiper is result of kinetic forces and gravity, as limited by contours of said cam surfaces.



3,749,042

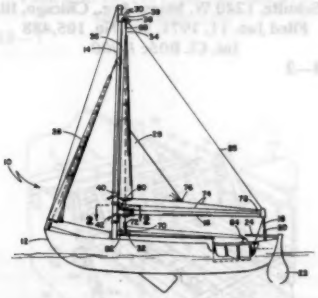
FURLING AND UNFURLING OF SAILS

Patrick T. Jackson, Oak Point, Boothbay Harbor, Maine

Filed Nov. 9, 1971, Ser. No. 196,961

Int. Cl. B63h 9/10

U.S. Cl. 114—106 **4 Claims**



A hinge-type fitting is disclosed for hingedly connecting the boom of a sailboat to the mast, the fitting having an opening coaxial with the vertical pivotal axis about which the boom swings horizontally through which a cable swivelly mounted aft of the mast may pass and on which the sail can be furled and unfurled, the set of the sail thereby being unaffected by the swinging of the boom to any hinged position.

3,749,043

SYSTEM FOR REEFING AND FURLING STAYSAILS

Donald H. Crall, 1580 Oleander Ave., Chula Vista, Calif.

Filed Nov. 15, 1971, Ser. No. 198,707

Int. Cl. B63h 9/04

U.S. Cl. 114—106 **10 Claims**

Spool sections are rotatably mounted on the stay for the sail. Tongue and groove connections cause the sections to rotate in unison. The luff of the sail is received in a longitudinal slot which is located aligned in each section. A drum is attached to the lowermost section and a furling line wound on the drum. By pulling the furling line and releasing the sheet

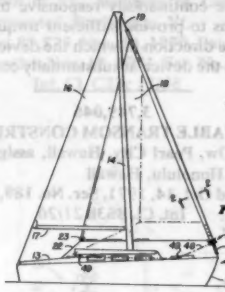


Fig. 1

(corner rope) of the sail, the sail may be wound on the spool sections and furled. Reverse of the operation unfurls the sail. By stopping the furling or unfurling operation at an intermediate position, the sail may be reefed to any desired extent.

3,749,044

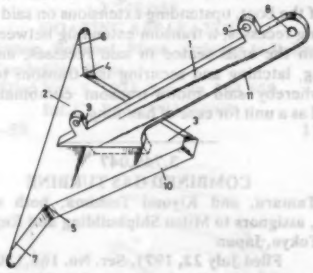
ANCHOR

Petrus Jozef Klaren, Frankenrode 3, Nieuwerkerk A/D Ijssel, Netherlands

Filed Feb. 19, 1971, Ser. No. 116,881

Int. Cl. B63b 21/32

U.S. Cl. 114—207 **8 Claims**



An anchor having a shank and a fluke, which is formed by a flat plate and the shank is fixedly secured to the plate at an angle α, which is smaller than 45°, and preferably 32°.

3,749,045

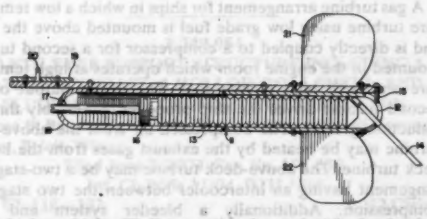
CONSTANT DEPTH TROLLING DEVICE

Charles D. Angus, Spring Lake, Mich., and John C. Angus, Cleveland Heights, Ohio, assignors to Angus Research Corporation, Spring Lake, Mich.

Filed Feb. 18, 1971, Ser. No. 116,381

Int. Cl. B63b 21/00

U.S. Cl. 114—235 B **5 Claims**



A device which will dive to a predeterminable depth when towed at normal trolling speeds of from about 2 to about 20

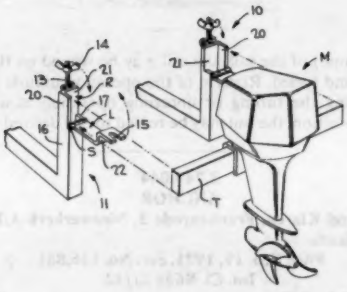
knots through a fluid and which maintains that depth solely as a function of the pressure exerted by the fluid. Pressure-responsive means within a cavity in the body of the device, which means are continuously responsive to fluid pressure, coact with means to provide sufficient torque in a direction orthogonal to the direction in which the device is being towed so as to maintain the device at substantially constant depth.

3,749,046

REMOVABLE TRANSOM CONSTRUCTION

Gordon Y. W. Ow, Pearl City, Hawaii, assignor to Go-Craft Systems, Inc., Honolulu, Hawaii

Filed Oct. 14, 1971, Ser. No. 189,081
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **6 Claims**



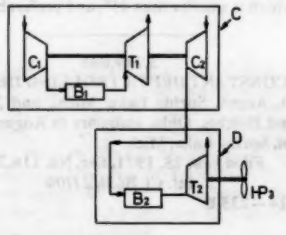
An outboard motor mounting for a boat includes frame means of the boat, upstanding extensions on said frame means containing recesses, a transom extending between said extensions with the ends seated in said recesses, and means for balancing, latching and securing the transom to said extensions, whereby said motor-transom combination may be removed as a unit for ease of handling.

3,749,047

COMBINED GAS TURBINE

Shigeo Tamaru, and Kiyomi Teshima, both of Okayama, Japan, assignors to Mitsu Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed July 22, 1971, Ser. No. 165,130
Claims priority, application Japan, July 28, 1970, 45/66000
Int. Cl. B63h *23/02*
U.S. Cl. 115—34 R **5 Claims**



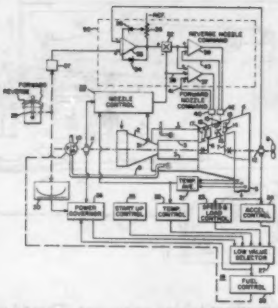
A gas turbine arrangement for ships in which a low temperature turbine using low grade fuel is mounted above the deck and is directly coupled to a compressor for a second turbine mounted in the engine room which operates at high temperature and with high quality fuel. The entire output of the second turbine drives the ship propeller, preferably through reduction gearing. The compressed air from the above-deck turbine may be heated by the exhaust gases from the below-deck turbine. The above-deck turbine may be a two-stage arrangement having an intercooler between the two stages of compression. Additionally a bleeder system and heat exchanger may be incorporated in the output of the first compressor.

3,749,048

SIGNAL DIVIDER FOR SPEED CONTROL OF DIRECT REVERSING GAS TURBINE

Robert M. Jones, and William I. Rowan, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1972, Ser. No. 231,181
Int. Cl. B63h *21/20*
U.S. Cl. 115—34 R **5 Claims**



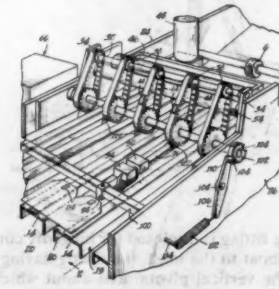
A speed control for a direct reversing gas turbine of the type adapted to separately control the flow of motive fluid through two sets of individually adjustable nozzles into forward and reversing blades on the load turbine. A nozzle control derives a command signal for total nozzle flow area from various operating conditions of the gas turbine. The command signal is split into ahead and astern nozzle command signals in a ratio which is determined by comparing propulsion lever position and propeller speed. The system maintains the desired total nozzle opening from the nozzle control, as well as the desired ratio between ahead and astern nozzle opening.

3,749,049

REMOISTENING APPARATUS

Herman J. Schultz, 1240 W. Morse Ave., Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,488
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **5 Claims**



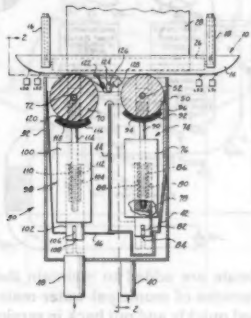
Remoistening apparatus for use in conjunction with paper folding comprises moisture applying members for wetting dry adhesive areas of a sheet prior to the sheet being fed to a machine in which the sheets are folded to provide envelopes or sheets with tear off envelopes attached thereto. The moisture applying members are cyclically operable to receive moisture from a supply and then to transfer the moisture to the dry adhesive areas of the sheet in synchronism with the sheets as they move through the apparatus so as to insure registry of the members with the adhesive areas. The members are on endless belts to facilitate their accurate positioning as well as replacement with different sizes of members for different sizes of dry adhesive areas to be moistened.

3,749,050

CLEANING SYSTEM FOR WETTING TANK ROLLERS

Peter J. Hastwell, Elizabeth Grove, Australia, assignor to Savin Business Machines Corporation, New York, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,761
Int. Cl. B05c *1/08, 11/04;* A46b *15/00*
U.S. Cl. 118—4 13 Claims



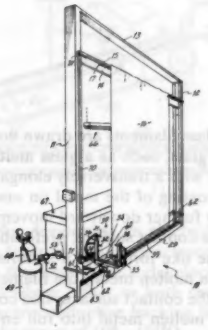
Cleaning apparatus for the rollers of the wetting system of an electrostatic copying machine in which arcuate pile pads are rapidly reciprocated into and out of contact with the roller surfaces during inactive periods thereof to scrub the surfaces while at the same time imparting rotary motion thereto to move them through the clean wetting liquid in the tank with which the rollers are associated.

3,749,051

DRAPERY MARKING APPARATUS

Paul E. Sumner, 1009 Lanette Dr., and Joseph E. Peter, both of Cincinnati, Ohio, assignors to said Sumner, by said Peter, Cincinnati, Ohio

Filed Jan. 18, 1971, Ser. No. 106,975
Int. Cl. B05c *5/00*
U.S. Cl. 118—7 10 Claims



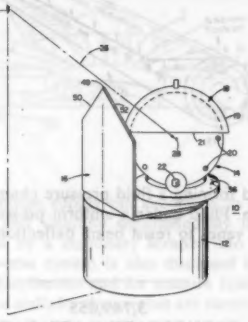
A drapery or curtain is hung from an adjustable frame so that it hangs freely in a similar manner to its intended use. One or more dye squirting orifices or nozzles traverse the width of the drapery at predetermined heights to mark cut-off or fold lines on the drapery and/or lining. The dye may be invisible as applied on the drapery and may become visible only when exposed to light of a predetermined wavelength for subsequent cutting, folding or sewing of the drapery. The orifice may be a hypodermic needle which provides a very thin continuous unbroken liquid stream or jet that marks the line on the drapery.

3,749,052

TILTING VARIABLE SPEED ROTARY SHADOWER

John Halsted Porter, Winooski, and William Alexander Ladd, Burlington, both of Vt., assignors to Ladd Research Industries, Incorporated, Burlington, Vt.

Division of Ser. No. 89,575, Nov. 16, 1970, Pat. No. 3,663,273.
This application Nov. 15, 1971, Ser. No. 198,511
Int. Cl. C23c *13/08*
U.S. Cl. 118—48 6 Claims



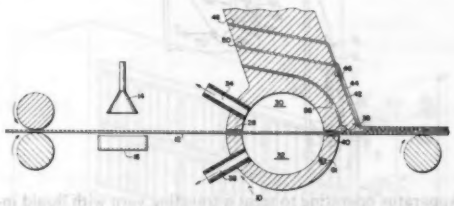
Method and apparatus for completely and uniformly coating a specimen for examination by a scanning electron microscope. The specimen is rotated and precessed for exposure of all upper portions to the beam of coating vapor, and is variably shielded from the beam to ensure uniformly thick coating of all portions.

3,749,053

COATING APPARATUS

William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 1, 1971, Ser. No. 194,669
Int. Cl. B05c *7/02, 11/06*
U.S. Cl. 118—50 11 Claims



Multiple layers of superposed coating solutions cascade onto the surface of a moving web which is maintained substantially flat in the region of application of the coating solutions. The web is passed through a vacuum chamber just prior to the coating region to provide a vacuum assist in drawing the coating solutions onto the web. Prior to entry into the vacuum chamber, the web may be sprayed with a coolant which is evaporated and drawn off by the vacuum so that gelling of the coating solutions will be hastened by the reduced temperature of the web.

3,749,054

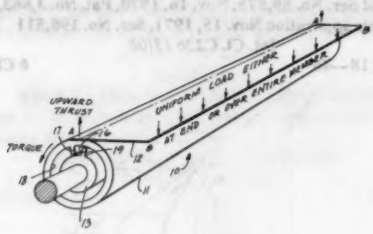
CANTILEVER SUPPORT STRUCTURE INCLUDING A STATIONARY SHAFT, A HOLLOW ROLL SHELL, AND A FLUID PRESSURE CHAMBER THEREBETWEEN

Jerome P. Brezinski, Neenah, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed June 7, 1971, Ser. No. 150,330
Int. Cl. B05c *11/04;* D21f *1/04*
U.S. Cl. 118—352 12 Claims

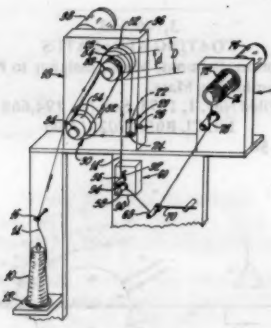
Fluid pressure balanced cantilever support structure, particularly adapted for paper making machinery, such as doctor

backs, headbox bottom aprons and the like. The support is in the form of a stationary shaft fixed at its ends having a roll shell rotatably mounted on the shaft. The shaft and roll shell have cooperating radial vanes sealed to the respective shaft



and shell and forming a fluid pressure chamber in the space therebetween. Fluid under a uniform pressure is maintained between the vanes to resist beam deflection and beam rotation.

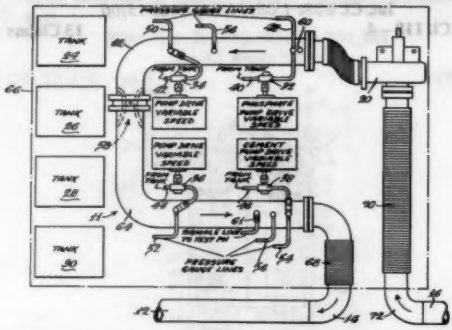
3,749,055
YARN TREATING APPARATUS
Gustav E. Benson, Edgewood, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed July 29, 1971, Ser. No. 167,399
Int. Cl. D02g *3/24, 1/16*
U.S. Cl. 118—234 **14 Claims**



Apparatus operating to treat a traveling yarn with liquid including adjacent rotatably mounted members each having an external groove circling its axis of rotation; means for advancing a yarn between the members and through a portion of each of the grooves; means for rotating the members together in opposite directions to move the walls of the grooves at a speed less than the speed of and in the same direction as yarn advancing through the grooves; and means for supplying a liquid to the grooves in advance of the yarn. The moving walls of the grooves move the liquid into contact with the yarn traveling through the grooves.

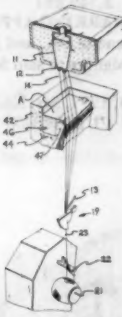
3,749,056
DEVICE FOR LINING PIPES WITH CALCITE
Norman S. Primus, East Orange, N.J., and Raymond Hunhoff, Oak Lawn, Ill., assignors to National Water Main Cleaning Co., Chicago, Ill.
Division of Ser. No. 820,101 Apr. 29, 1969
Filed May 24, 1971, Ser. No. 146,490
Int. Cl. B05c *7/08*
U.S. Cl. 118—408 **8 Claims**

A device is provided for lining pipes and the like with calcite. The device includes a reaction and mixing chamber in a U-shaped tube through which a supersaturated solution of calcium carbonate is circulated and delivered through the pipe to be lined. The solution is recycled from the pipe through the reaction chamber where calcium chloride and



sodium carbonate are added to maintain the supersaturated conditions. Portions of municipal water main systems can be closed off, lined quickly and put back in service.

3,749,057
METHOD AND APPARATUS FOR COATING OF FILAMENTS
Bordie B. Garick, 1564 Kenarbre Drive, Newark, Ohio
Continuation-in-part of Ser. No. 777,001, Nov. 19, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 107,195
Int. Cl. B05c *3/176*
U.S. Cl. 118—420 **4 Claims**

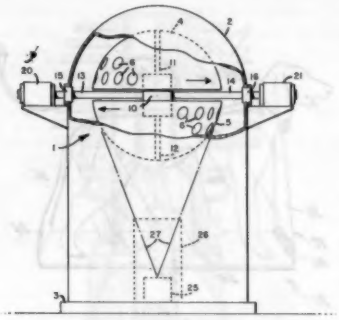


A plurality of glass filaments are drawn downwardly from a supply of molten glass, such as a glass melting bushing, into tangential contact with a transversely elongate lip of a molten metal to yield a coating of the metal on one side of the filament, followed by further downward movement momentarily contactingly past a contact surface, preferably as provided by a rod or bar or the like formed of a material resistant to the temperature of the molten metal; the filaments being slightly bent as they pass the contact surface; said contact creating an urgement of said molten metal into full envelopment of individual filaments.

3,749,058
ROTARY SUBSTRATE HOLDER ASSEMBLY
Edward J. Slabaugh, San Jose, Calif., assignor to Ion Equipment Corp., Santa Clara, Calif.
Filed July 26, 1971, Ser. No. 165,940
Int. Cl. B05c *11/14*
U.S. Cl. 118—500 **10 Claims**

A rotary substrate holder assembly comprising a pair of hemispherical substrate supporting members is provided to

hold and retain a plurality of substrates during film deposition, ion implantation and other material treatment processing. The substrate supporting members or holders are supported within a bell jar by a pair of horizontally extending drive shafts. Holder support shafts and gear means are provided to operate in conjunction with the drive shafts to rotate each of the holders about their respective axes, as well as about an axis



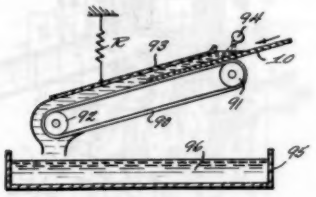
orthogonal to their respective axes. Single and dual motor drives and various gear ratios are provided for driving the holders with various ratios of rotational and revolutionary motion therefore available as is required by a particular application. In addition, means are provided to separately control rotational and revolutionary motion imparted to the holders for use in step and repeat processes and the use of flat as well as dish-shaped substrate holders.

3,749,059

APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Masamichi Sato, Asaki-shi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1970, Ser. No. 67,473
Claims priority, application Japan, Aug. 27, 1969, 44/67795
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **12 Claims**



An apparatus for developing an electrostatic latent image on an insulating layer having an electroconductive backing layer by spacing the layer from a developing electrode in a developing liquid where either or both the developing electrode and the electroconductive backing layer are grounded via resistance in the range of $10^8 - 10^{12}\Omega$.

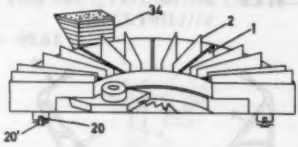
3,749,060

CIRCULAR PEN FOR BROOD SOW WITH PIGLETS

Jakob Wagner, Straubinger Strasse 21, 8404 Worth, Germany

Filed Sept. 24, 1971, Ser. No. 183,431
Int. Cl. A01k *1/02*
U.S. Cl. 119—16 **23 Claims**

A circular pen for brood sows with piglets has a free center area for keeper personnel which is surrounded by an inner manure depositing area, while radial constricting boxes for the dam and piglet compartments close to them are provided between the manure area and an external ring-shaped feed trough. The constricting boxes with the piglet compartments, the feed troughs and the manure depositing area rotate in the feeding cycle rythm whereby the feed trough is consistently



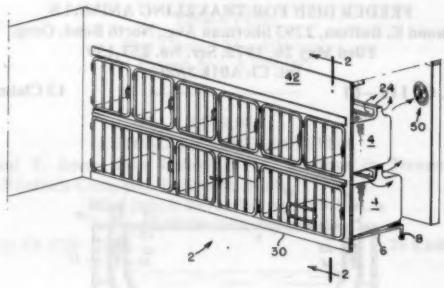
filled from a common supply bin according to a daily controlled program and whereby simultaneously the incurring manure is moved by a stationary scraper into a collecting channel. The reverse system is also disclosed in which the means for food distribution and for manure removal may be rotatable while the stalls for the animals are stationary.

3,749,061

VENTILATED STACKABLE ANIMAL CAGES

Richard L. Connelly, 9142 N. Mercer Way, Apt. 89, Mercer Island, Wash.

Filed Jan. 28, 1972, Ser. No. 221,562
Int. Cl. A01k *01/02*
U.S. Cl. 119—19 **8 Claims**



An animal cage made of a fiber impregnated plastic or other suitable material having impermeable side, bottom and end walls and a permeable hinged door closing the front end thereof. The top portion of the cage is similarly integrally formed but has at least one upstanding hollow integrally formed rib therein which serves to support a cage stacked vertically above and includes openings in the side portions of the rib permitting a ventilating air flow therethrough. A plurality of cages may be used in a back wherein they are stacked in vertical rows with their front portions substantially planar. Sealing elements may then be placed round the front of the cages forming a solid wall and and the area behind the wall may be closed forming a plenum, which with the addition of an exhaust fan draws any objectionable odor through the rear of the cages and out of the building, while simultaneously preventing stagnant air buildup.

3,749,062

APPARATUS FOR THE AUTOMATIC DISTRIBUTION OF FEED

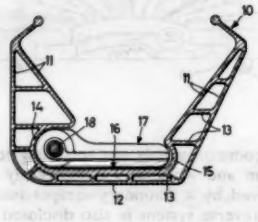
Camillo Pirovano, Via Spluga, Cernusco Lombardone (Como), Italy

Filed Mar. 18, 1971, Ser. No. 125,787

Claims priority, application Italy, Mar. 21, 1970, 22269 A/70

Int. Cl. A01k *05/00, 39/00*

U.S. Cl. 119—51 CF 1 Claim



An apparatus for the automatic distribution of feed in zootechnical breeding farms, particularly chicken farms and the like, consists of a cable running in a seating formed on one side of a feedbox. A plurality of oblong fins are duly spaced one from the other along the cable, each being secured to the said cable at one extremity and extend unilaterally from it. The opposite extremity of the said fins run in a spaced seating formed on the other side of the said feedbox. The seatings substantially prevent rotation of the fins about the cable away from the bottom of the feedbox.

3,749,063

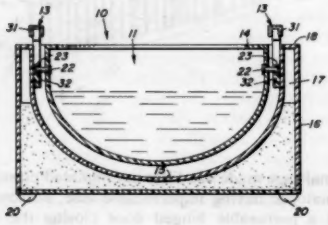
FEEDER DISH FOR TRAVELING ANIMALS

Edmond E. Buffum, 2293 Sherman Ave., North Bend, Oreg.

Filed May 26, 1972, Ser. No. 257,159

Int. Cl. A01k *5/00*

U.S. Cl. 119—61 13 Claims



A pet feeding dish, particularly suited for use when traveling, comprises a frusto-spherical bowl or container supported by two in line pins attached to opposite sides of the container near the open rim. The pins in turn are pivotally held by a box shaped base weighted with sand or other appropriate material in such manner that the container is free to pivot about the axis of the pins. The rim of the container is also provided with an turned-in lip to reduce spilling of liquids contained therein when the feeder is placed on a swaying platform, such as a ship or boat.

3,749,064

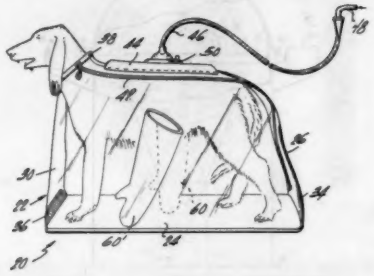
APPARATUS FOR BATHING DOGS

Howard Weinstein, 15 Hereford Ln., New City, N.Y., and Edward C. Carenza, 94 Sanford Ave., Emerson, N.J.

Filed Apr. 17, 1972, Ser. No. 244,697

Int. Cl. A01k *13/00*

U.S. Cl. 119—158 10 Claims



An apparatus for washing, drying, spraying and defleaing animals comprising a housing of transparent flexible material having an opposed pair of flexible mittens which extend into the housing and having working elements thereon for treating the coat of an animal.

3,749,065

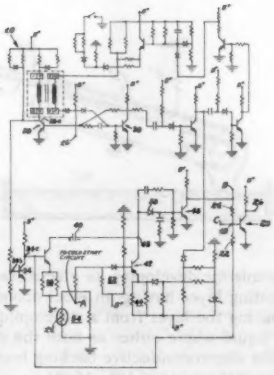
ACCELERATION ENRICHMENT CIRCUIT FOR ELECTRONIC FUEL CONTROL SYSTEMS

Ralph W. Rothfusz, Southfield, and John R. Nagy, Detroit, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 17, 1970, Ser. No. 11,988

Int. Cl. F02b *3/00*; F02m *39/00*

U.S. Cl. 123—32 EA 3 Claims



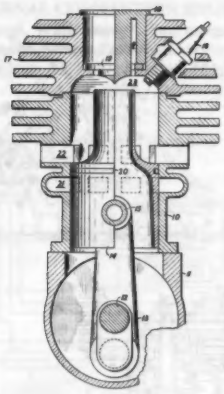
An acceleration enrichment circuit is disclosed which is operative to sense a demand for engine acceleration and which subsequently lengthens the duration of the fuel injection command to reduce or eliminate response time largs. The circuit includes a first circuit to provide an immediate pulse of fuel to the injector group most recently energized and a second circuit to lengthen the injection commands to each injector for a period of time sufficient to accomplish the desired acceleration.

3,749,066

INTERNAL COMBUSTION ENGINE

Ferenc Cseh, 37 Passaic St., Passaic, N.J.

Filed Feb. 22, 1971, Ser. No. 117,398
Int. Cl. F02d 39/04
U.S. Cl. 123—65 S 2 Claims



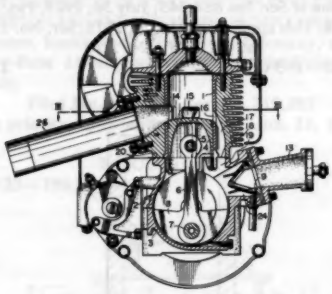
A transfer postless two-stroke cycle internal combustion engine that has a stepped tube-like piston that cooperates with a cylinder head of related form to provide better scavenging and more horse power relative to present engines.

3,749,067

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Torao Kobayashi, and Hisashi Inaga, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 19, 1971, Ser. No. 200,332
Int. Cl. F02b 33/04
U.S. Cl. 123—73 AF 3 Claims



A two-cycle internal combustion engine comprising a cylinder having an exhaust port, an exhaust passage, a main scavenging port, a main scavenging passage, an auxiliary scavenging port and an auxiliary scavenging passage; a piston; a connecting rod; a crank shaft; a crank case and an intake reed valve mounted on said crank case for introducing therethrough fuel-air mixture into said crank case; in which the end of said auxiliary scavenging passage open at one end into said crank case is located substantially in alignment with a tangential line of circular periphery of one of crank webs of the crank shaft, which tangential line extends parallel to the axis of said cylinder from crank web portion moving toward said cylinder, and said intake reed valve is located between said open end of the auxiliary intake passage and said crank web in the proximity to said tangential line, whereby a part of the mixture having been drawn into said crank case through said intake reed valve is forcibly fed into said cylinder through said auxiliary scavenging passage and said auxiliary scavenging port under the booster effect of the rotating crank web, thus enhancing the fuel charging efficiency of the engine.

3,749,068

PUSH ROD STRUCTURE

Harry E. Andrews, Bloomfield Hills, Mich., assignor to Production Tube Company, Inc., Detroit, Mich.

Filed Nov. 1, 1971, Ser. No. 194,636
Int. Cl. F01l 1/14
U.S. Cl. 123—90.61 2 Claims

A push rod of the type which is used to operably interconnect a valve lifter and a valve operating rocker arm comprising an elongated hollow tube having one or more longitudinally extending corrugations or grooves in the wall thereof to improve the strength of the tube and increase the surface area to promote cooling. The invention also includes a method of making the tube.

ERRATUM

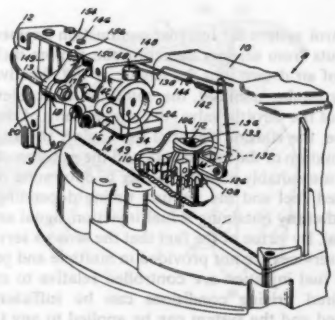
For Class 123—106 see:
Patent No. 3,749,097

3,749,069

AUTOMATIC CHOKE SYSTEM

Paul T. Reese, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed July 2, 1971, Ser. No. 159,199
Int. Cl. F02d 9/00; F02m 1/16
U.S. Cl. 123—108 25 Claims



An automatic choke system for the carburetor of an internal combustion engine featuring a resilient member located

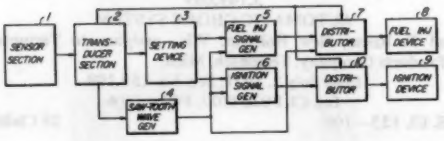
within the air-fuel mixture conduit of the carburetor and operable through a lost-motion connection with the throttle to selectively position the choke in accordance with the position of the throttle over a selected range of movement thereof. During a last increment of movement of the throttle toward full open position, the resilient member yieldably urges the choke towards its choking position. As the engine starts, with the throttle in full open position and the choke in choking position, the resilient member permits the choke to flutter in response to engine suction thereby preventing overchoking as the engine accelerates. A conventional engine governor becomes operable above a selected speed to increasingly move the throttle away from its open position. As the throttle leaves the open position, the resilient yieldable member is backed off from its yieldable engagement with the choke so that the choke can be biased by its spring and air pressure away from the choking position so that automatic choking is provided only during engine starting. Thereafter, the choke is fully open and the throttle is modulated by the governor. A second governor is integrated with the first governor to restrict the movement of the first governor when the engine encounters a heavy load which significantly reduces engine speed. This restriction similarly restricts throttle movement so that the throttle cannot operate the choke via the resilient member. The second governor is automatically reset by stopping the engine and then setting the engine operating control to a combined "start-run" position so that automatic choking is always provided when the engine is being restarted.

3,749,070

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi; Tokuhiro Kurebayashi, and Noriyoshi Ando, all of Kariya, Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed Nov. 2, 1970, Ser. No. 85,987
Claims priority, application Japan, Nov. 13, 1969, 44/90970
Int. Cl. F02p *5/04, 1/00;* **F02b** *3/00*
U.S. Cl. 123—117 R **4 Claims**



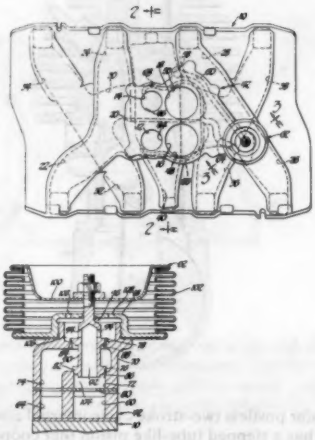
A control system for internal combustion engines in which the outputs from sensors detecting the factors including the amount of air drawn into the engine or the negative pressure in the air intake manifold, the condition of acceleration, the position of the throttle valve, the temperature of the warmed-up engine, the starting signal of the engine, the angular position of rotation of the crankshaft, and the position of a specific cylinder are suitably added together to determine the amount of injected fuel and the ignition timing depending on these outputs thereby obtaining a fuel injection signal and an ignition signal. By virtue of the fact that the sensors serving the individual services are not provided in multiple and yet the ignition and fuel injection are controlled relative to each other, any desired driving conditions can be sufficiently freely established and the system can be applied to any type of engines by merely modifying the parts for the programming of various settings so that standardization of various parts can be easily realized.

3,749,071

EXHAUST GAS RECIRCULATION CONTROL VALVE

James J. Gumbleton, Troy, Mich., and Paul B. Kuehl, South Bend, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1972, Ser. No. 245,590
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **2 Claims**



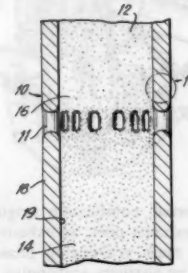
A metal bellows responsive to exhaust back pressure positions a valve to control recirculation of exhaust gases from the intake manifold exhaust crossover passage to the intake manifold induction passages.

3,749,072

INTERNAL COMBUSTION ENGINE CYLINDER LINERS

Ernest W. Schweikher, New Haven, Conn., assignor to Chromium Corporation of America, Waterbury, Conn.

Division of Ser. No. 854,345, July 30, 1969, Pat. No. 3,657,078. This application Mar. 8, 1971, Ser. No. 122,241
Int. Cl. F02f *1/20, 1/16*
U.S. Cl. 123—193 C **12 Claims**



A lining is provided for an internal combustion engine cylinder in which different degrees of roughness are imparted to those portions of the lands of the liner surface subjected to low and high pressures. The lands of the low pressure portions of the cylinder liner have a high degree of roughness for providing lubrication pockets for cooling the compression rings and for providing lapping of the rings during break-in so as to conform those surfaces in relative movement with each other. The lands of the high pressure portions of the cylinder liner have a low degree of roughness for reducing the oil retaining capacity thereof adjacent the combustion chamber for in turn eliminating the burning of lubricating oil while

simultaneously presenting a relatively smooth surface to the compression rings during the time they are under high pressure in order to eliminate cocking of the rings and scoring of the liner.

3,749,073

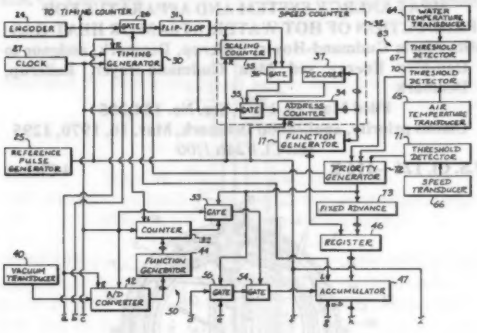
ELECTRONIC IGNITION TIMING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Robert W. Asplund, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Nov. 23, 1971, Ser. No. 201,362

Int. Cl. F02p 1/00

U.S. Cl. 123—148 E **18 Claims**



An electronic ignition timing system for internal combustion engines is disclosed which utilizes electronic circuitry to vary the timing of ignition pulses in response to engine speed and vacuum to provide optimum or improved performance by the engine. Preferably the electrical circuitry utilizes digital signals for high accuracy.

3,749,074

OIL TANK FOR ROTARY PISTON INTERNAL COMBUSTION ENGINE WITH DRY SUMP LUBRICATION

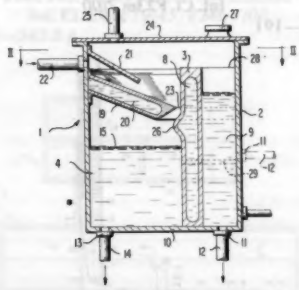
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 20, 1972, Ser. No. 219,285

Claims priority, application Germany, Jan. 21, 1971, P 21 02 699.3

Int. Cl. F01m 5/00

U.S. Cl. 123—196 R **16 Claims**



An oil tank for a rotary piston internal combustion engine, in particular of trochoidal construction with a dry sump lubrication of the engine and with a metered fresh oil lubrication of the piston running surface within the casing of the housing, which includes a feed and discharge line, a vent line and a filler pipe; a second oil tank storing the oil supply for the fresh oil lubrication is arranged in the oil tank directly below the filler pipe which second tank is in communication with the main oil tank by way of an overflow and has a separate discharge; an inclined drainage wall is arranged above the oil level in the principal oil tank which extends across the oil tank and terminates shortly in front of the second tank; at least one wall of the second tank and/or the drainage wall is provided with hollow spaces which are in communication with the cooling circulation of the internal combustion engine.

3,749,075

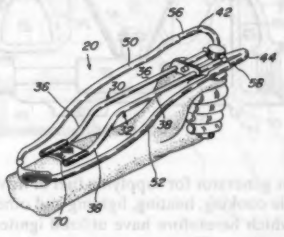
SLINGSHOT WITH CONNECTION FOR PROJECTILE PROPELLING ELASTIC MEMBER

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Co., Columbus, Nebr.

Filed Apr. 26, 1972, Ser. No. 247,705

Int. Cl. F41b 7/00

U.S. Cl. 124—20 R **9 Claims**



In a slingshot having reversely hooked fork arms for securement of missile-projecting elastic tubes thereto, flexible and resilient spine-like probes fastened to and extending coaxially of rearwardly directed ends the hooked fork arms to buffer, control, and limit forward fold-over of the elastic tubes over the ends of the hooked fork arms upon recoil after distention and release of the elastic tubes, whereby the tubes are protected against extreme flexure and from abrasive wear against ends of the hooked fork arms during use of the slingshot. The probes extend into the ends to a position internally of the elastic members.

3,749,076

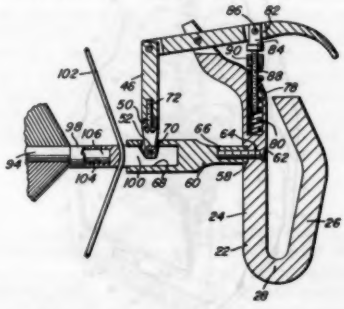
ARROW NOCK AND TRIGGER ACTUATED RELEASE THEREFOR

Michael D. Suski, 5031 Kermit St., Flint, Mich., and Michael R. Suski, 313 N. Elms Rd., Flushing, Mich.

Filed June 18, 1971, Ser. No. 154,448

Int. Cl. F41b 5/00

U.S. Cl. 124—31 **4 Claims**



An archer's handgrip including support structure for supporting the nock on the rear end of an arrow against lateral deflection. The support structure includes a finger releasable

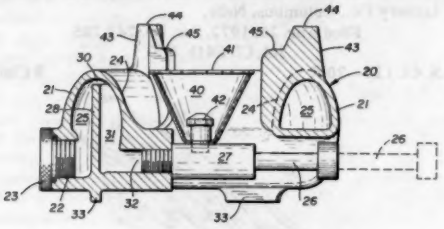
latch mechanism releasably engageable with notches in the nock portion of the supported arrow and retains the supported arrow nock against forward movement relative to the support structure, the latch mechanism and support structure being engageable with the rear end portion of the associated arrow nock rearward of the forward end of the bow string accommodating slot of the arrow nock.

3,749,077

VAPOR GENERATOR

John F. Cross, Denver, Colo., assignor to Noni Corporation, Denver, Colo.

Filed Oct. 26, 1971, Ser. No. 192,028
Int. Cl. F24c 5/02
U.S. Cl. 126—44 **7 Claims**



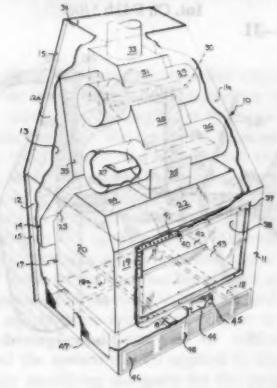
A vapor generator for supplying fuel in its vapor phase only to portable cooking, heating, lighting and other apparatus and devices which heretofore have utilized ignited liquid fuels in their operations. The generator comprises a combination liquid fuel and vapor containing housing, generally annular in form and elliptical in vertical cross section, from which the efflux is confined to fuel in its vapor phase only. Heating means applied to the generator maintain the liquid fuel at vaporizing temperatures, and ignitable contact between the liquid fuel and the heating means is prevented. The housing has a vapor outlet for conveying vapor for utilization in cooking or lighting means which are parts of the generator construction or for utilization in separate devices such as radiant heaters and the like.

3,749,078

SPACE HEATER

Raymond R. Dupler, deceased, late of Toledo, Ohio (by Anna Gertrude Cooley Dupler, executrix)

Continuation of Ser. No. 126,134, March 19, 1971, abandoned. This application June 22, 1972, Ser. No. 265,226
Int. Cl. F24b 7/00
U.S. Cl. 126—121 **6 Claims**



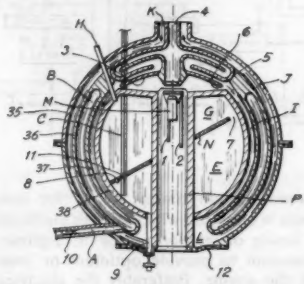
A space heater particularly adapted for a gas fired log arrangement, which has a front window through which the flames can be viewed. A combustion chamber is arranged within and spaced from a housing, the products of combustion passing upwardly through baffle devices to secure full benefit of the heat. Room air passes by convection around the combustion chamber and baffle devices where it is heated and then passes out through a top opening. An air tight opening through the combustion chamber and housing is covered by a heat resistant glass window panel. Around a portion of the edge of the window panel are holes leading to the inside of the housing to enable air from the outside to pass to the inside of the housing, thereby to supply fresh air to be heated and also to impart a cooling influence on the glass window panel.

3,749,079

HEAT ENERGY SYSTEM AND APPARATUS FOR PRODUCTION OF HOT WATER, STEAM OR HEAT-GAS

Mita Maria Gudmand-Hoyer, Ballerup, Denmark, assignor to Dan-Fire Energy ved Mita Gudmand-Hoyer, Ballerup, Denmark

Filed Mar. 15, 1971, Ser. No. 124,255
Claims priority, application Denmark, Mar. 16, 1970, 1295
Int. Cl. F24h 1/00
U.S. Cl. 126—116 R **4 Claims**



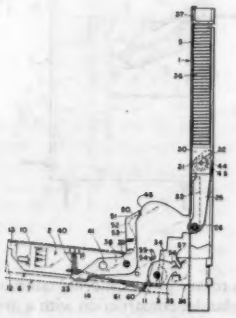
An apparatus for the production of hot water, steam or hot gas and having a burner with a unidirectional annular flame from which the hot gaseous flow is led into a narrow ring-shaped channel in which the jet of hot gas on each side is covered by a stratum of air carried along with the gas. The heat from the gas flow channel is transmitted to a channel system for the supply of a heat transmitting medium to centrally placed placed chamber surrounded by the annular gas flow channel.

3,749,080

OVEN DOOR HINGE

Walter H. Kleinhenn, Flourtown, Pa., assignor to United Filtration Corporation, Chicago, Ill.

Filed Mar. 2, 1972, Ser. No. 231,126
Int. Cl. F23m 7/00
U.S. Cl. 126—191 **6 Claims**



A structure especially useful as a hinge to support an oven door comprising a spring which is self contained within a cas-

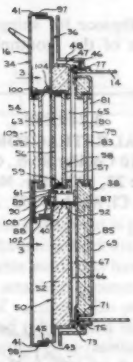
ing and a counter balancing system operatively connected between the door and the spring together with latch mechanism operative during assembly of the hinge to the oven to lock the hinge in a partially open position so that the same cannot close and injure the assembler and damage the oven.

3,749,081

WINDOWED OVEN DOOR WITH ROTATABLE INNER PANEL

Arthur C. Wilson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 3, 1972, Ser. No. 268,709
Int. Cl. F23m *7/00*
U.S. Cl. 126—200 **11 Claims**



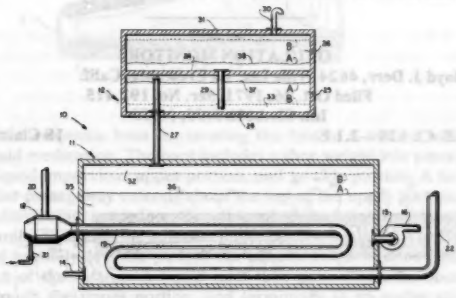
A windowed oven door design for a high-temperature self-cleaning oven. The door has a window of multi-panes of transparent glass. There is an insulated inner door panel that is supported from the door for rotation on a central pivot. This inner panel also has a window opening with a glass pane. During normal cooking operations, the window of the inner panel is aligned with the window of the door for viewing within the oven cavity. In preparation for the self-cleaning cycle, the inner panel is first reversed so that it blocks the window opening of the door. Convection air currents pass through the door for cooling purposes during the cleaning cycle.

3,749,082

EXPANSION SYSTEM FOR ASPHALT PLANT OIL HEATER

James Donald Brock, Chattanooga, Tenn., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Feb. 24, 1972, Ser. No. 228,861
Int. Cl. E01c *19/45;* **F24h** *1/00*
U.S. Cl. 126—343.5 A **3 Claims**



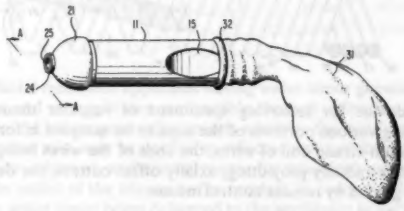
An oil expansion system for an asphalt plant closed loop oil heater wherein a body of inert gas is maintained in contact with the surface of the oil in the oil heater to inhibit the oxidation of the oil. The inert gas in the oil heater tank communicates through a conduit with the upper portion of a lower expansion chamber partially filled with liquid, and the liquid in the lower expansion chamber communicates through a second conduit with an upper expansion chamber at a higher level, so that the rising and receding level of oil in the heater tank due to thermal expansion and contraction displaces the inert gas to the lower expansion chamber, and the inert gas, in turn, displaces the liquid from the lower portion of the lower tank to the upper tank, causing the inert gas to be trapped between the two bodies of liquid.

3,749,083

MIDDLE EAR INFLATOR

William T. Mathes, Jr., 208 E. Watauga Ave., Johnson City, Tenn.

Filed July 14, 1971, Ser. No. 162,562
Int. Cl. A61b *17/24;* **A61m** *13/00, 1/00*
U.S. Cl. 128—1 R **12 Claims**



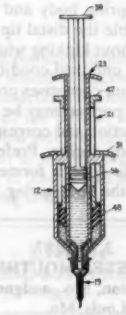
A medical device for gently forcing air through the nostrils and eustachian tubes into the middle ear. The middle ear inflator comprises a hollow body portion having a nozzle for insertion into the patient's nostril at one end and an inflatable balloon attached to the other end. The device provides a steady and gentle stream of air at a pressure sufficient to treat ear disorders without causing injury or unnecessary discomfort to the patient.

3,749,084

SEQUENTIALLY DISPENSING SYRINGE WITH MULTIPLE NEEDLE ASSEMBLY

Alfred L. Cucchiara, 2428 Redbud Lane, Apt. G, Lawrence, Kans.

Filed May 3, 1971, Ser. No. 139,769
Int. Cl. A61b *5/00;* **A61m** *5/00*
U.S. Cl. 128—2 F **6 Claims**



This invention relates to a syringe having two or more dispensing chambers therewithin operable to dispense from or fill independent chambers in any desired sequential order. More specifically, this invention relates to a syringe having a

multiple needle assembly connected to a main housing and having an inner dispensing and outer dispensing assemblies operable to independently either dispense or receive fluids, such may be operable to inject fluids into the blood system at variable steps thereon which process is most desirable when utilizing radio-active fluids for medical analysis.

3,749,085

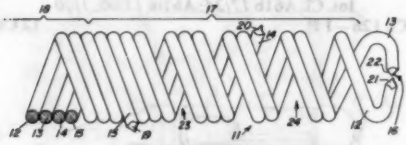
VASCULAR TISSUE REMOVING DEVICE

James K. V. Willson, and Marshall Eskridge, both of P.O. Box 7544, Mobile, Ala.

Continuation-in-part of Ser. No. 50,182, June 26, 1970, Pat. No. 3,683,891. This application May 17, 1971, Ser. No. 144,029

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 B 12 Claims



A device for removing specimens of vascular tissue by scraping various portions of the area to be sampled is formed by a multi-strand coil of wires, the ends of the wires being cut to define radially projecting, axially offset cutters, the device being guided by remote control means.

3,749,086

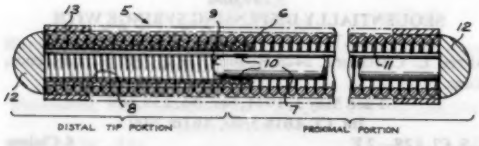
SPRING GUIDE WITH FLEXIBLE DISTAL TIP

William M. Kline, and Charles C. Roach, both of Gloversville, N.Y., assignors to Medical Evaluation Devices & Instruments Corp., Gloversville, N.Y.

Filed July 24, 1972, Ser. No. 274,273

Int. Cl. A61m *25/00*

U.S. Cl. 128—2 M 10 Claims



This invention is directed to a spring guide having an elongated helically wound spring body and a composite internal core constructed to enable the distal tip portion of the spring guide to flex readily without kinking while retaining its ability to return to its normally unflexed condition after having been flexed. The composite core comprises proximal and distal portions in which the distal portion may be relatively more flexible than the proximal portion and corresponds in length to the distal portion of the body spring. Preferably, the distal end portion of the composite core is formed as a helical spring coiled counter to that of the body spring.

3,749,087

SPIROMETER MOUTHPIECE

Robert E. N. Klohr, Fenton, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 881,836, Dec. 3, 1969, abandoned. This application Feb. 16, 1972, Ser. No. 226,954

Int. Cl. A61b *5/08*

U.S. Cl. 128—2.08 3 Claims

A disposable mouthpiece and flexible bag which are adapted to be connected with a spirometer or spirometer interface. The mouthpiece is completely surrounded by the flexible bag with a major portion of said bag being inserted within

the bore of the mouthpiece for shipping. In use the bag is forced from the bore of the mouthpiece into an interface device or spirometer.

3,749,088

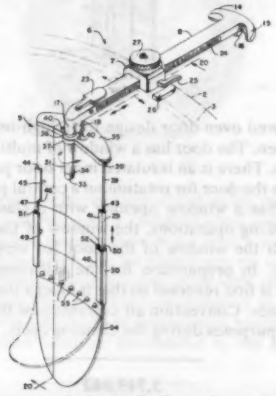
SURGICAL RETRACTOR DEVICE

William Kohlmann, 310 Codifer Blvd., Gauthier, Metairie, La.

Filed June 23, 1971, Ser. No. 155,846

Int. Cl. A61b *17/02*, *1/32*

U.S. Cl. 128—20 23 Claims



A surgical retractor device including a frame means, quick release means adjustably mounting a plurality of retractor arm means to said frame means for movement relative thereto, and an automatically self-adjusting retractor blade means mounted to said retractor arm means, said retractor blade means automatically adjusting itself to different lengths and pivotal positions and including means for locking the retractor blade means in a desired adjusted position.

3,749,089

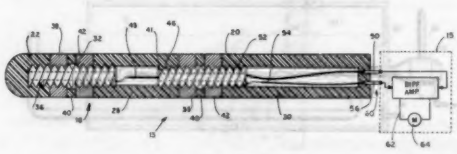
OVULATION MONITOR

Lloyd J. Derr, 4624 Willa Lee, La Crescenta, Calif.

Filed Oct. 26, 1971, Ser. No. 192,415

Int. Cl. A61b *5/00*, *10/00*

U.S. Cl. 128—2.1 E 18 Claims



An instrument for monitoring ovulation including a dual electrode vaginal probe and monitoring device for indicating

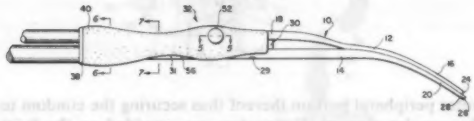
the magnitude and polarity of the electrochemical response of vaginal fluids with the electrodes. The instrument detects the biochemical change of vaginal fluids from an acidic oxidative response to the temporary reductive response occurring coincident with ovulation. This response can be utilized for an aid to contraception, as an aid to conception or to aid in determining the sex of offspring.

3,749,090

COMBINATION ASPIRATOR AND FLUID DELIVERING SURGICAL INSTRUMENT

James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.

Filed June 9, 1971, Ser. No. 151,372
Int. Cl. A61m *3/00*
U.S. Cl. 128—240 **11 Claims**



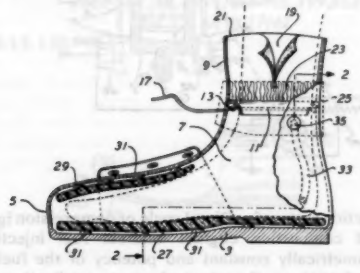
A combination surgical instrument is provided for applying vacuum and delivering fluid to a work area. The instrument includes a readily detachable work tool having a fluid delivering tube and an integrally attached vacuum-applying tube, with the entrance end of the vacuum tube projecting beyond the entrance end of the fluid tube; and a handle connectable to sources of fluid and vacuum and resistant to sterilizing temperatures and having a first passage for receiving the fluid delivery tube; and a second passage having a cutaway portion to expose an elongated section of the passage along an exterior surface of the handle for receiving the vacuum-applying tube.

3,749,091

THERAPEUTIC BOOT CONSTRUCTION

Napoleon A. Basa, 46 Cordillers St., Quezon City, Philippines

Filed Aug. 23, 1971, Ser. No. 173,957
Int. Cl. A61p *5/40*; A01l *7/02*
U.S. Cl. 128—260 **7 Claims**



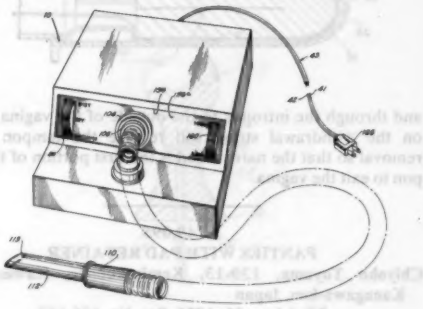
A therapeutic boot for treating the foot of a wearer with liquid medication. The boot includes a shoe weight sole piece, a liquid impervious upper portion, and an akle portion. A tubular passageway extends about the top of the upper portion, a drawstring extending therethrough being tightenable to thereby compress the adjacent upper portion against the ankle and partially seal the part of the boot therebelow about the foot of the wearer. A liquid inlet tube passes into the boot through the upper portion, and terminates at an outlet adjacent the sole piece. Removable liquid absorbent pads are secured to the interior of the boot at the sole piece and at the area overlying the toes of the wearer.

3,749,092

FACIAL TREATMENT APPARATUS

David R. Williams, Dallas, Tex., assignor to Mary Jane Savage, Dallas, Tex., a part interest

Filed Mar. 21, 1972, Ser. No. 236,650
Int. Cl. A61f *7/00*
U.S. Cl. 128—256 **6 Claims**



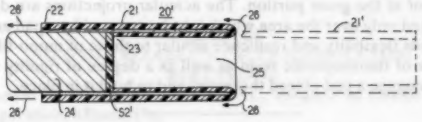
A facial treatment apparatus having water vapor generating means and an applicator connectible through a flexible conduit to the steam generating means whereby the water vapor or a water mist may be applied to selected areas of the skin of the face, a blower, and control means for selectively connecting the outlet of the blower to the conduit, in order to add air to the water vapor being delivered to the applicator to vary the temperature of the water mist being applied to the face, or the inlet of the blower after the skin has been subjected to the mist whereby a suction may be applied to the ar eas of the skin encompassed by the applicator to remove fluids and extraneous matter from the surface of the skin and its pores.

3,749,093

INSERTABLE DEVICE PACKAGE

Stefan A. Bloom, 12 Fay Dr., East Hanover, N.J.

Filed Aug. 10, 1971, Ser. No. 170,435
Int. Cl. A61f *15/00*
U.S. Cl. 128—263 **10 Claims**



An insertable device package formed by an elongated, enclosed sheath which is sealed at opposite, leading and trailing ends and contains the insertable device. The trailing end of the sheath, near the base of the device, forms a pocket which is depressible by an external member that controllably forces the device through the seal at the leading end of the sheath and becomes enveloped by it. The device is thereafter inserted, for example, into an opening of a body.

3,749,094

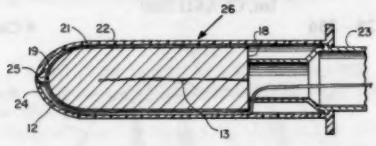
TAMPON WITH STRING ATTACHED TO ITS PROXIMAL END

Robert C. Duncan, Wyoming, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Aug. 18, 1971, Ser. No. 172,789
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **8 Claims**

A tampon prepared for use and used so that the narrow end of a tampon, which is wide at one end and narrow at the other

end when subjected to intravaginal pressures, is the last point of attachment for the withdrawal string and that narrow end is located deepest in the vagina. After being placed, the string extends from the narrow end, along the side of the tampon,



and through the introitus to the outside of the vagina. A pull on the withdrawal string will reverse the tampon during removal so that the narrow end is the first portion of the tampon to exit the vagina.

3,749,095

PANTIES WITH PAD RETAINER

Chiyoko Toyama, 139-13, Kamisakunobe, Kawasaki-shi, Kanagawa-ken, Japan

Filed Aug. 31, 1971, Ser. No. 176,657
Int. Cl. A61f *13/16*
U.S. Cl. 128—288 **9 Claims**

Panties provided with pad retainer which comprises a number of acicular projections planted on the inner surface thereof at the groin portion. The acicular projections are distributed only over the area which is to be covered by a pad and exhibits flexibility and resilience similar to those of mono-filaments of thermoplastic resin as well as a degree of rigidity so as to engage a pad placed thereover and to hold it in place.

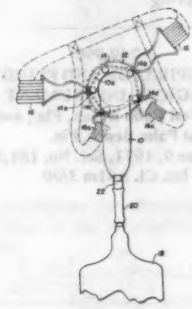
3,749,096

INCONTINENT APPLIANCE

Leslie W. Donaldson, 3561 Quadra St., Victoria, British Columbia, Canada

Filed Aug. 27, 1971, Ser. No. 175,713
Claims priority, application Canada, May 4, 1971, 112,089
Int. Cl. A61f *5/44*
U.S. Cl. 128—293 **5 Claims**

An improved incontinent appliance which may be easily and quickly fitted to the male patient and which is inexpensive, sanitary and light in weight. The invention provides a device for securing a rubber sheath or drainage condom on the human penis. This device is particularly well suited for use with roll-on, commercially available rubber condoms of the type having a rolled-up ring at the open end thereof. These condoms are inexpensive and are simply discarded after use. The device for securing the rubber sheath or condom on the penis comprises an annular retainer having a central aperture therein of sufficient diameter to permit the annular retainer to be slipped over the penis to which a condom has been applied and brought into contact with the patient's body. The annular element is provided with an outer peripheral portion. In use, the condom, which was previously rolled on to the patient, is manually stretched so as to draw the rolled up portion of same outwardly between the patients' body and the rear face of the annular element and around and over the above mentioned



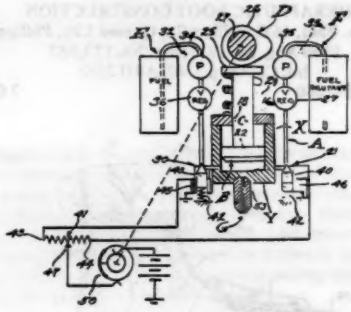
outer peripheral portion thereof thus securing the condom to the annular element. Connectors are provided on the front face of the annular element to permit the latter to be securely fastened to the patient by means of belts, straps or the like which are passed around the patients' body in appropriate fashion and secured to the above mentioned connectors.

3,749,097

INTERNAL COMBUSTION ENGINE CONTROL

Harlow B. Grow, Pacific Palisades, Calif., assignor to Craig H. Grow, Pacific Palisades and Bruce W. Grow, Manhattan Beach, Calif., part interest to each

Filed Dec. 14, 1970, Ser. No. 97,527
Int. Cl. F02d *13/00*
U.S. Cl. 123—106 R **20 Claims**



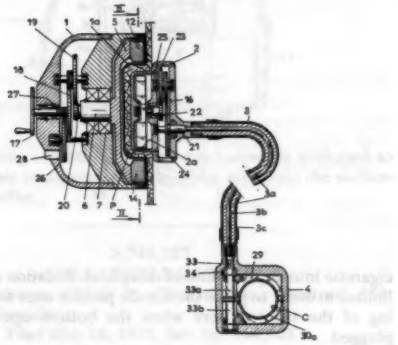
A fuel injection system for Diesel cycle or compression ignition internal combustion engines wherein fuel injection remains volumetrically constant and potency of the fuel is varied dependent upon the required power application. A constant stroke and constant volume injector pump is operated in timed relation to the engine crankshaft rotation, with a fuel mixing and displacement unit for each engine cylinder involved. The structural functions are: low pressure metering and homogenous mixing together of at least two liquid fuels, one of maximum potency and one of lesser or minimum potency such as a dilutant and/or other additives as may be required; the averaging of power throughout multiple power strokes or revolutions; and the constant volume injection which results in full stroke fuel injection and reduced peak pressure and smoothness of operation in lighter weight engine structures; all of which is due to the controllability of the injection process.

3,749,098

APPARATUS FOR INTRACORPOREAL CONTROL, IN PARTICULAR OF THE CROSS-SECTION OF AN ORGANIC VESSEL OR DUCT

Michel Cotton De Bennetot, Brest, France, assignor to Agence Nationale de Valorisation de la Recherche, Paris, France

Filed Apr. 7, 1971, Ser. No. 132,083
Claims priority, application France, Apr. 7, 1970, 7012618
Int. Cl. A61b *17/08, 17/12;* F16k *31/08*
U.S. Cl. 128—346 5 Claims



An apparatus for causing a semi-permanent constriction of an intracorporeal duct comprises a synchronous magnetic coupling having driving and driven rotors and in accordance with the invention, a flexible transmission connecting the output shaft of the driven rotor to an intracorporeal valve provided with flaps which control the cross-section of the duct.

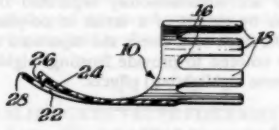
A feature of the invention is that the extracorporeal housing of the driving rotor and the intracorporeal housing of the driven rotor are adapted for interlocking while leaving a clearance therebetween for insertion of a skin projection.

3,749,099

DIGITAL AMNIOTOME

John Cotey, Haddonfield, N.J., assignor to Medspec, Inc., Frederick, Md.

Filed Nov. 18, 1971, Ser. No. 199,852
Int. Cl. A61b *17/42*
U.S. Cl. 128—361 5 Claims



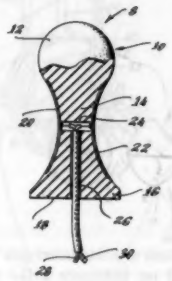
The digital amniotome described herein is a split-ring like device adapted to be placed on a finger for rupturing the amniotic membrane during obstetrical procedures. The ring-lke device has a recessed portion which is normally positioned to be located at the pad of the fingertip and has a sharp tipped element thereon. Immediately contiguous to the recessed portion is a guard portion which extends out beyond the recessed portion to prevent the sharp tipped element from contacting the amniotic membrane. When pressure is applied to the guard portion, which is resilient, it retracts thereby exposing the sharp tipped element such that it is able to rupture the membrane.

3,749,100

SUPPOSITORY ELECTRODE STRUCTURE

Hans A. Von Der Mosel, Cliffside Park, N.J., assignor to Bio-Controls Corp., New York, N.Y.

Continuation of Ser. No. 752,352, Aug. 13, 1968, Pat. No. 3,650,275. This application Sept. 13, 1971, Ser. No. 179,726
Int. Cl. A61n *1/02*
U.S. Cl. 128—407 3 Claims



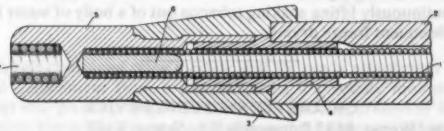
An electrostimulation probe comprising a suppository b0dy formed with a rounded bulbous head, a reduced neck, and a broadened hilt, is inserted into the anus of a patient suffering from incontinence. The rounded bulbous tip and reduced neck facilitate anal insertion and subsequent retention. The rounded neck is clasped by the sphincter rectalis, and is provided with a pair of spaced electrical contacts which rest against the sphincter. The broadened hilt limits insertion of the suppository body, and has a substantially flat base so as to permit the patient to set or lie down confortably with the device inserted. A pair of electrical leads are connected respectively to the contacts, which are energized by a square wave signal having an average value of zero Volts, a peak potential between 1 and 2 Volts, and in the frequency range from about 18 to about 20 Hertz. Such electrostimulation causes tonic and physiological contraction of the sphincter muscle, with significant results in the control of incontinence.

3,749,101

NONPOLARIZABLE MUSCLE STIMULATING ELECTRODE

Donald E. Williamson, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Feb. 9, 1972, Ser. No. 224,831
Int. Cl. A61n *1/04*
U.S. Cl. 128—418 7 Claims



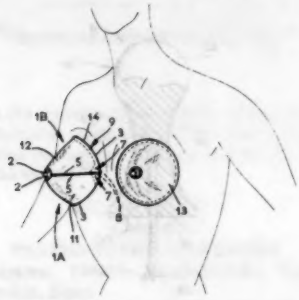
A nonpolarizable muscle stimulating electrode is formed of a platinum black insert in a housing of inert electrode metal, preferably titanium. It features high current density at low pulse voltage.

3,749,102

IMPROVED FORM OF BRASSIERE

Marcelle Wynants, 291 Chaussee de Bruxelles, Grimbergen, Belgium

Filed Dec. 2, 1971, Ser. No. 222,928
Claims priority, application France, Dec. 11, 1970, 7044680
Int. Cl. A41c *3/00, 3/10*
U.S. Cl. 128—505 **8 Claims**



There is provided a covering, part at least of which adheres the chest in which at least the lower part of each breast is enveloped.

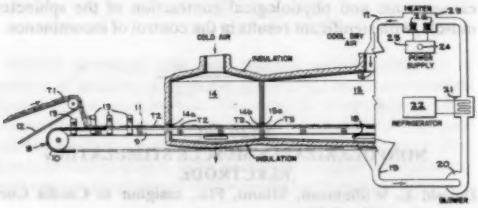
The invention concerns the method of utilizing said novel breast supporting means.

3,749,103

APPARATUS FOR CONTINUOUS PREPARATION OF TOBACCO

John A. Abbott, Menlo Park, and Clyde D. Watson, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 884,850, Dec. 15, 1969, Pat. No. 3,704,716. This application Sept. 20, 1971, Ser. No. 181,787
Int. Cl. A24b *03/18*
U.S. Cl. 131—136 **10 Claims**



Expanded Tobacco in a Continuous Process is disclosed. The apparatus comprises a continuously driven conveyor on which moist tobacco is carried, the conveyor passing through a freezing chamber and a drying chamber. Means are provided to circulate dry cool air at substantially atmospheric pressure within the drying chamber. There is also shown apparatus fo continuously lifting soaking tobacco out of a body of water for subsequent freeze drying.

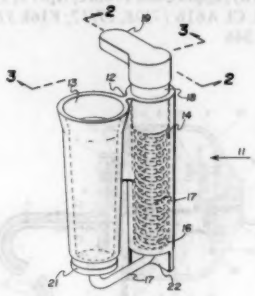
3,749,104

CIGARETTE SNUFFING DEVICE

Peter Wansa, 8622 Dunwoodie Rd., Santee, Calif.

Filed Aug. 7, 1972, Ser. No. 278,185
Int. Cl. A24f *13/18*
U.S. Cl. 131—256 **2 Claims**

A cigarette snuffing device having a main body portion with a tapered bore in one end thereof dimensioned for receiving a cigarette and a second body portion having a bore adjacent thereto and having a parallel axis for receiving a spring loaded rod coupled to a handle portion for depressing the rod, the rod terminating in a stopper which plugs the lower opening of the tapered bore and can be removed by depressing the handle portion and rotating the rod, dropping the extinguished



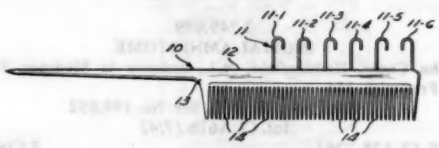
cigarette into any convenient receptical. Rotation of the rod is limited in order to place the handle portion over the top opening of the tapered bore when the bottom opening is unplugged.

3,749,105

HAIR-COLORING METHOD AND APPARATUS THEREFOR

Joseph J. Sestita, 4348 W. 134 St., Cleveland, Ohio

Division of Ser. No. 682,315, Nov. 13, 1967. This application Aug. 25, 1970, Ser. No. 66,908
Int. Cl. A45d *7/00*
U.S. Cl. 132—7 **3 Claims**



Hair-coloring method and device therefor whereby smaller strands of hair are simultaneously separated from larger strands or locks by means of a series of co-planar hooks, preferably on the back of a comb; the separated strands are then separately colored to provide frosting, highlighting, or shadowing (reverse highlighting) effects.

3,749,106

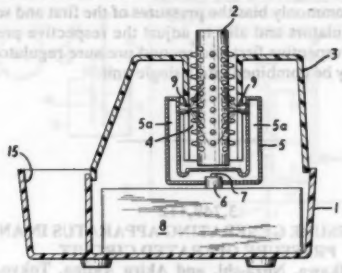
HAIRSETTING APPARATUS HAVING MEANS FOR MOISTENING THE SURFACE OF THE HAIR ROLLERS

Erik Kelmann, Jerslev, and Rasmus Krohn, Kalundbourg, both of Denmark, assignors to Bristol Meyers Company, New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,746
Claims priority, application Denmark, Sept. 9, 1970, 4642/70
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 **17 Claims**

A hairsetter having hair rollers heated by support pins on which the hair rollers are mounted, is provided. The hairsetter has a moistening chamber in which one or more rollers can be positioned after they are heated. The moistening chamber has

means such as a spray nozzle which is connected to a reservoir containing a hair treatment liquid. When a roller is placed in



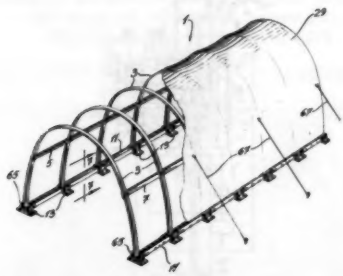
the moistening chamber, a pump mechanism is activated to spray the hair treatment liquid in a fine mist onto the surface of the hair roller.

3,749,107

COLLAPSIBLE GARAGE

Norman Laberge, 10460 St. Charles Ave., Montreal 358, Quebec, Canada

Filed May 18, 1971, Ser. No. 144,465
Int. Cl. A45f *1/00*
U.S. Cl. 135—1 **9 Claims**



A collapsible garage or the like building which comprises a plurality of upstanding spaced apart arch shaped structural members disposed in parallel relationship to one another. The lower ends of the arch shaped structural members are received in a pair of channel members which are fixed, such as by nailing, to the ground. A flexible top covering is spread over the arch shaped structural members and the lower edges of this covering are held by the channel members.

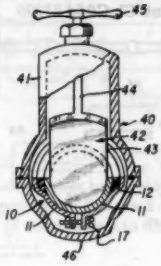
3,749,108

ADD-ON SLIDE GATE VALVE FOR EXISTING PIPING

George M. Long, Hinsdale, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Apr. 28, 1972, Ser. No. 248,661
Int. Cl. B23b *41/08*; F16e *41/04*
U.S. Cl. 137—15 **8 Claims**

The invention comprises a valve stopper which includes, generally, a rubber patch clamp which is used in combination with a slide gate valve assembly, both of which can be added to an existing fluid piping system without shut-down or interruption of flow. The rubber patch clamp first is affixed to the pipe, and then rubber patch clamp and pipe beneath are sawed through with, for example, a hacksaw or other thin blade or carborundum wire blade. As the blade passes through the compressed rubber patch of the clamp, the rubber tends to close around and behind the blade minimizing fluid leakage from the sawn pipe beneath. The pipe is sawn roughly in half, and the blade then is removed. The slide gate of a slide gate valve assembly is extended from its bonnet, extended partly into the sawn slot in the rubber patch clamp and the pipe



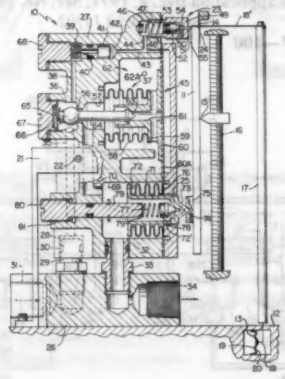
beneath. Thereafter, the installation is completed by affixing the entire slide gate valve assembly on the pipe, over the rubber patch clamp.

3,749,109

SELF-CONTAINED RELAY MODULE UNIT AND SYSTEM UTILIZING THE SAME

Jacob R. Rosenfeld, Roslyn, and Philip G. Van Osten, King of Prussia, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 22, 1971, Ser. No. 191,633
Int. Cl. G05d *16/00*
U.S. Cl. 137—85 **13 Claims**

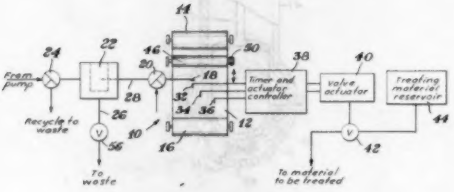


A self-contained relay module unit for ready attachment to and detachment from a device having a pivotally mounted lever that pivots in response to changes in the operation of the device, the self-contained unit having a housing provided with a pilot nozzle that senses pivotal movement of the lever. The housing has a force balancing member that is adapted to engage the lever and pivot the same in a direction opposite to the pivot thereof by the changes in the operation of the device so as to place the lever in a balanced condition thereof. The housing has a relay valve means for causing such movement of the force balancing member in relation to the lever condition being sensed by the pilot nozzle.

3,749,110
SLUDGE FILTRATION DEVICE

Stacy L. Daniels, and Joseph P. Graham, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 5, 1972, Ser. No. 241,136
Int. Cl. G05d 11/00
U.S. Cl. 137—92 7 Claims



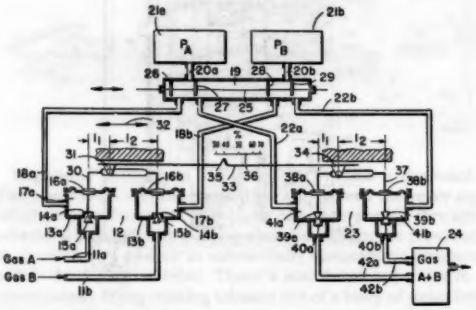
The invention is a device for use in applying treating material to a filterable sludge such as sewage, for example. A small amount of sludge is applied to a porous surface. Detector means spaced from the point of application of the sludge senses the degree of flow of liquid from the sludge across the porous surface. The sensors are coupled to electrical means actuating flow control means in the treating material line to increase, decrease, or not affect the flow of treating material, depending on the rate said liquid path expands on said porous surface.

The porous surface moves. The application of sludge may be continuous or discontinuous.

3,749,111
APPARATUS FOR MIXING PRESSURE GASES PARTICULARLY FOR RESPIRATORS AND MEDICAL DEVICES

Gunter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Germany

Division of Ser. No. 45,372, June 11, 1970, Pat. No. 3,669,134.
This application Dec. 2, 1971, Ser. No. 204,083
Int. Cl. G05d 11/02
U.S. Cl. 137—100 16 Claims

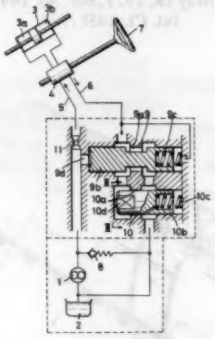


Two gases are supplied to respective chambers, having fixed or adjustable preselected volumes, through respective first pressure regulators while maintaining the discharge pressures of the two first pressure regulators in such predetermined ratio. The flow of the two gases to the chambers is then interrupted, and the two gases are thereafter discharged from the respective chambers to a common discharge line through respective second pressure regulators while maintaining the discharge pressures of the two second pressure regulators in such predetermined ratio. The apparatus includes adjustable means for conjointly adjusting both the first and second pressure regulators so that the discharge ratios thereof are equal and equal to the predetermined ratio. A reversing valve may be used to connect the chambers to the first pressure regulators or to discharge the chambers through the second pressure regulators. A magnetically biased torsion resistant lever may be used to commonly bias the pressures of the first and second pressure regulators and also to adjust the respective pressure ratios. The respective first and second pressure regulators for each gas may be combined into a single unit.

3,749,112
BACKPRESSURE GENERATING APPARATUS IN AN OIL PRESSURE OPERATED CIRCUIT

Masao Nishikawa, Niiza-shi, and Akira Akima, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 211,938
Claims priority, application Japan, Dec. 28, 1970, 45/119705
Int. Cl. F15b 11/08
U.S. Cl. 137—106 7 Claims



A backpressure generating apparatus in an oil pressure-operated circuit in which an oil supply circuit and an oil return circuit are formed between an oil pressure source and an oil pressure-operated device and supply of oil to the device is regulated by a control valve interposed in the circuits; a no-load passage and a throttle passage are interposed in the oil return circuit in parallel with one another, such that the no-load passage is open during ordinary operation when the oil is at low pressure when the device is not operated, whereas when a high pressure is generated in the oil supply circuit during operation of the device, the no-load passage is closed by the action of the high pressure and the oil is by-passed through the throttle passage. An orifice is interposed in the oil supply circuit to heat the oil when the pressure is high due to cold operation conditions.

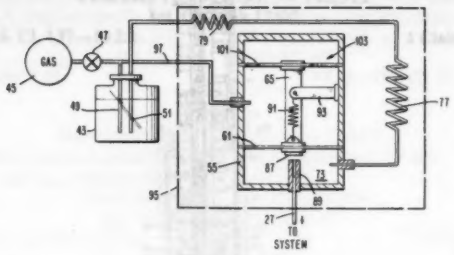
3,749,113
FLOW REGULATOR FOR CONTROLLING ULTRA-LOW VOLUMETRIC FLOW RATES

Jack Isreeli, Mamaroneck; Aaron Kassel, Tarrytown, and Edwin H. Mernyk, Brunswick, all of N.J., assignors to Technician Instruments Corporation, Tarrytown, N.Y.

Filed Sept. 14, 1970, Ser. No. 71,699
Int. Cl. F04f 11/06
U.S. Cl. 137—209 4 Claims

A flow regulator for ultra-low volumetric flow rates is described having excellent self-purging and self-cleaning

characteristics, wherein the valve assembly, or control seat, is formed in elongated fashion and supported in frictionless



manner at, at least, two points along its length to insure positional stability.

3,749,114

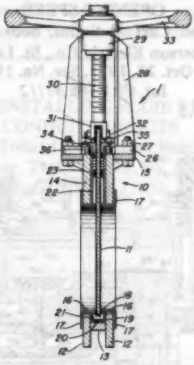
TWO WAY PULP STOCK VALVE

Robert F. Johnstone, 601 Church St., Beaconsfield 870, and Kodandraman Balasubramanian, 104 Woodlawn Dr., Dollard des Ormeaux, Quebec, both of Canada

Filed Nov. 26, 1971, Ser. No. 202,094

Int. Cl. F16k *3/314, 27/04*

U.S. Cl. 137—244 **2 Claims**



A gate valve comprising a valve body having inlet and outlet portions with curved walls of circular cross-section defining a flow passage, a gate blade slot between said inlet and outlet portions, a pair of annular seat members formed integrally with the walls of the flow passage and defining a gate blade receiving pocket therebetween, a gate blade having a semicircular end projecting through the slot having a groove of V-shaped cross-section in the peripheral edge face thereof, the blade being encapsulated in a layer of resilient material whereby during closing the resilient blade coating is pressed into leak tight engagement with both seat members, and, the V-shaped groove edges scrape the seat members clean, while build-up of pulp in the pocket is prevented.

3,749,115

DAMPER APPARATUS WITH FLUID SEAL

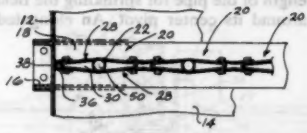
George Joseph Raftis, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 29, 1971, Ser. No. 213,424

Int. Cl. F16k *1/22;* **F24f** *13/16*

U.S. Cl. 137—246.22 **5 Claims**

Dampers operative in a duct system are provided with a hollow body that is connected to a source of fluid maintained at a higher pressure than that of the gases passed through the duct. Means are provided along the edges of the dampers to contain sealing fluid admitted thereto when the dampers are disposed



in a fully closed position thus to provide a fluid seal that is effective to prevent passage of the gases conducted through the duct from one side of the dampers to the other.

3,749,116

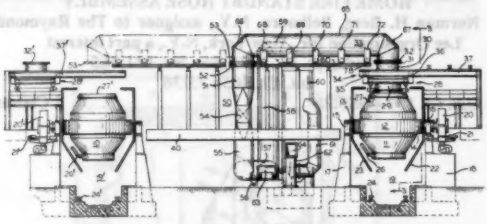
GAS HANDLING SYSTEM FOR METALLURGICAL VESSELS

Alexander T. Dortenzo, Pittsburgh, and Stanley T. Sczerba, McKeesport, both of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,173

Int. Cl. C21c *5/40*

U.S. Cl. 137—255 **11 Claims**



A gas conduit means is supported for bidirectional movements in the vicinity of two metallurgical vessels whose smoke and evolved gases are collected during operation. The conduit means normally couples one active vessel with gas cleaning apparatus. When the one vessel is taken out of service for rebuilding or maintenance, the conduit is transferred so that it couples the other vessel with the same gas cleaning apparatus. The arrangement reduces the probability of noxious gases from the active vessel reaching the vicinity of the inactive vessel at which workmen may be present.

3,749,117

DRIVE MECHANISM FOR A SELF-PROPELLED IRRIGATION SYSTEM

Blaine E. Garwood, Rt. 1, Atkinson, Nebr.

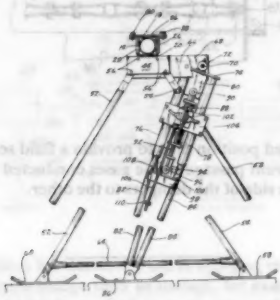
Filed Nov. 17, 1971, Ser. No. 199,582

Int. Cl. B05b *9/02;* **E01h** *3/02*

U.S. Cl. 137—344 **3 Claims**

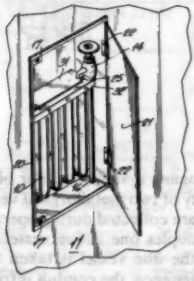
A drive mechanism for a self-propelled irrigation system is disclosed herein. The irrigation system includes an elongated

water distribution pipe having one end pivotally supported and in communication with a source of water pressure. A plurality of spaced apart support towers are secured to the distribution pipe along the length thereof for supporting the pipe above ground level. A plurality of sprinklers are provided along the length of the pipe for sprinkling the field as the pipe is moved around its center pivot. An elongated extendible



member is pivotally secured at its upper end to each of the towers and extends downwardly and laterally therefrom so that its lower end is in ground engagement. A hydraulic cylinder means is connected to the extendible member for selectively causing the extendible member to be extended whereby said extension causes the tower to be moved laterally to propel the pipe. Alignment means is also provided for selectively controlling the operation of the hydraulic cylinder.

3,749,118
HOME FIRE STANDBY HOSE ASSEMBLY
Norman H. Berg, Bellmore, N.Y., assignor to The Raymond Lee Organization Inc., New York, N.Y., a part interest
Filed Sept. 16, 1971, Ser. No. 181,065
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.28 **2 Claims**



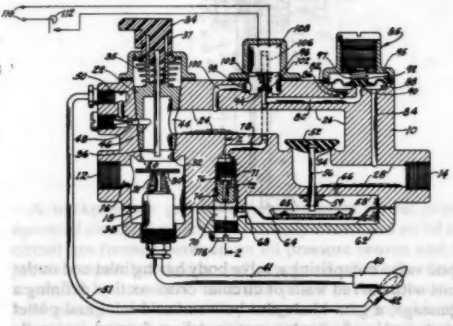
A compact fire-fighting unit for home use comprising a rack assembly to support folded fire hose and nozzle which is connected to a water pipe and valve, with a magnetically latching door. The unit may be fastened to wall studs for flush mounting. The rack unit is of two-piece construction so that the hose may be readily slipped off rack when required.

3,749,119
PRESSURE ACTUATED SAFETY VALVE
Gilbert H. Tausch, and Fred E. Watkins, Houston, Tex., assignors to Camco Incorporated, Houston, Tex.
Filed Nov. 19, 1971, Ser. No. 200,414
Int. Cl. F16k *17/02*
U.S. Cl. 137—461 **7 Claims**

A pressure actuated and resettable safety valve for controlling the flow through a well conduit which closes in response to an increase in pressure in the well conduit. Resetting means for opening the valve include a releasable piston for reopening the valve and resetting the valve closing

mechanism. The valve closing mechanism retracting the resetting mechanism for resetting the valve to its initial position for reuse.

3,749,120
DIAPHRAGM GAS VALVE WITH ADJUSTABLE OPENING SPEED
John J. Love, and Carl A. Smith, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 28, 1971, Ser. No. 193,503
Int. Cl. F16k *31/12*
U.S. Cl. 137—489.5 **7 Claims**



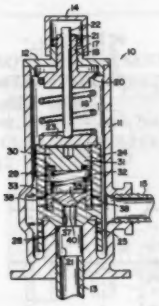
A biased closed diaphragm operated gas valve having one side of the operating diaphragm exposed to a first zone of pressure, a restricted passageway connects the other side of the diaphragm to the same pressure zone thereby to equalize the pressure on both sides of the diaphragm and permit the gas valve to close, and a branch of the passageway including a control valve connects the other side of the diaphragm to a second zone of different pressure when the control valve is opened thereby resulting in unequal pressure on the diaphragm and causing the valve to be opened. A portion of the passageway between the junction of the branch and the other side of the diaphragm comprises a tortuous spiral path of adjustable length lying along and between the screw threads of a screw threaded portion of the passageway and the threads of a screw threaded member threadedly engaged therein, whereby the change from equal to unequal pressure upon opening of the control valve is slowed and full opening of the gas valve is delayed. There is also the provision of a bypass which is open to flow tending to equalize pressure on opposite sides of the diaphragm and closes in response to a reversal of flow.

3,749,121

RELIEF VALVE APPARATUS

Peter A. Frankewich, R.R. 2, Box 372, Daytona Beach, Fla.

Filed May 11, 1971, Ser. No. 142,312
Int. Cl. F16k 17/00
U.S. Cl. 137—512.2 1 Claim



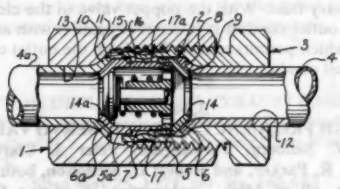
A tamper proof safety relief valve having both a basic relief valve and a safety relief valve capability incorporated therein. The relief valve is adapted to open a valve port when a predetermined pressure is applied thereagainst and a tamper proof safety relief element is adapted to open a valve port through said relief valve when a predetermined pressure is reached. If the basic relief valve fails to operate, the safety relief element will come into operation at a pressure just beyond the operating pressure of the basic relief valve.

3,749,122

SYSTEM FOR INSTALLING FLUID ELEMENTS IN CONDUIT CIRCUITS

Harold Gold, 3645 Tolland Rd., Shaker Heights, Ohio

Filed Apr. 27, 1971, Ser. No. 137,880
Int. Cl. F16k 15/00
U.S. Cl. 137—515.7 7 Claims



This invention relates to the construction of elements of fluid circuits such as: check valves, pressure and flow regulating valves, circuit breaking valves, restrictors, filters and the like. The construction utilizes the element housing to form a conduit fitting seat-insert. The form thereby permits the circuit element to be installed within a conduit fitting such as a union.

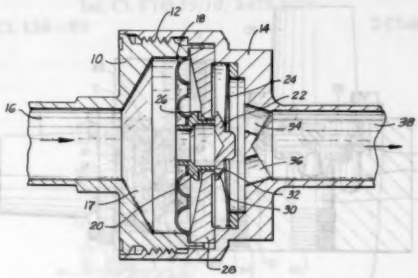
3,749,123

DUAL STAGE CHECK VALVE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and David E. Whitten, North Hollywood, Calif.

Filed Dec. 10, 1971, Ser. No. 206,698
Int. Cl. F16k 15/00
U.S. Cl. 137—516.27 5 Claims

A dual stage seat valve head arrangement is provided consisting of a primary sealing point located between a fixed orifice seat and a valve poppet, and a secondary sealing point between an orifice poppet and a valve poppet. Upstream of the valve orifice is a flexible, convoluted metal diaphragm attached to the orifice poppet. Downstream of the valve orifice, a finger spring exerts a force against the valve poppet, tending to keep the valve in a closed position. The series arrangement



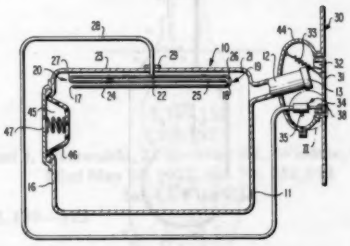
of a double seat and poppet is able to tolerate small particle contamination while minimizing chatter by controlling throttling or metering across the secondary seat, thus preserving the primary sealing surface.

3,749,124

INSTALLATION FOR THE VENTING OF A FUEL TANK OF A VEHICLE

Rudolf Andres, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 20, 1971, Ser. No. 181,810
Claims priority, application Germany, Sept. 22, 1970, P 20 46 562.7
Int. Cl. F16k 45/00
U.S. Cl. 137—587 16 Claims



A vent system for venting fuel tanks of a motor vehicle in which a vent valve is connected with the interior space of the tank within an upper central area of the tank whereby the valve actuating member cooperates with a tank lid closing off the filler pipe of the fuel tank against visibility from the outside in such a manner that the interior space of the tank is closed off in the normal position of the tank lid whereas it is connected with the atmosphere upon opening of the tank lid.

3,749,125

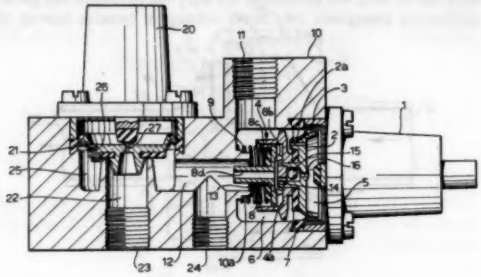
SOLENOID-ACTUATED PNEUMATIC ACTUATOR FOR ANTI-SKID VEHICLE BRAKING SYSTEMS

Marco Peruglia, and Giovanni Anselmino, both of Turin, Italy, assignors to Flat Societa per Azioni, Turin, Italy

Filed July 27, 1971, Ser. No. 166,485
Claims priority, application Italy, Feb. 26, 1971, 67679A/71
Int. Cl. G60t 8/12; B60t 8/62
U.S. Cl. 137—596.16 5 Claims

This invention relates to an electropneumatic control device arranged to be connected in a pneumatic brake control system responsive to electrical signals from a wheel acceleration sensor. The device includes two solenoid valves, both of which are energized when a brake release signal is received from the wheel sensor: one solenoid valve is normally open to

allow bidirectional flow therethrough between a pressure inlet and a delivery port and the second solenoid valve is normally closed, permitting unidirectional flow from the delivery port to a discharge port when open. When an incipient skid is de-



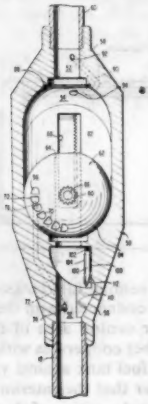
tected and both solenoid valves are energized, compressed air is discharged through the second valve via a controlled discharge device, causing initially a sharp small fall in brake pressure followed by a gradual fall, until normal braking is restored.

3,749,126

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING FLUID FLOW

Frank E. Addison, Lafayette, La., assignor to James Boring Montgomery, Anatole J. Plaisance, Howard L. Franques, Jr. and Joseph Arabie Jr., all of Lafayette, La., part interest to each

Filed May 3, 1972, Ser. No. 249,913
Int. Cl. F16k *35/00*; E21b *33/06*
U.S. Cl. 137—613 **19 Claims**



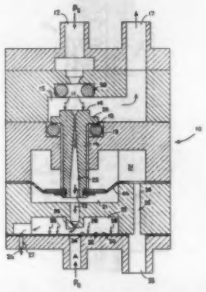
An automatic flow control apparatus including a generally elongate housing which may be inserted within a fluid flow line. The housing has a first end suitable for connection with one portion of a flow line and a second end suitable for connection with a spaced portion of the flow line. Interiorly, the housing is provided with a central longitudinal passage which includes an enlarged longitudinally extending chamber intermediate the first and second ends of the housing. A first valve is mounted within the enlarged chamber for rotation and longitudinal translation from an open position at a first end of the enlarged chamber to a closed flow blocking position at a second end thereof. A second valve is positioned within the housing generally at the first end thereof and adjacent to the central longitudinal passage for automatically inducing, in response to impingement of a surge of fluid flow, rotation and longitudinal translation of the first valve from an open position into a closed position within the enlarged chamber.

3,749,127

FAST ACTING, LOW PRESSURE, TWO POSITIONED VALVE

Basil B. Beeken, New Haven, and Vladimir Ignatjev, Norwalk, both of Conn., assignors to Switch Co., Florham Park, N.J.

Filed Oct. 18, 1971, Ser. No. 190,066
Int. Cl. F16k *31/385*, *11/07*
U.S. Cl. 137—625.6 **10 Claims**



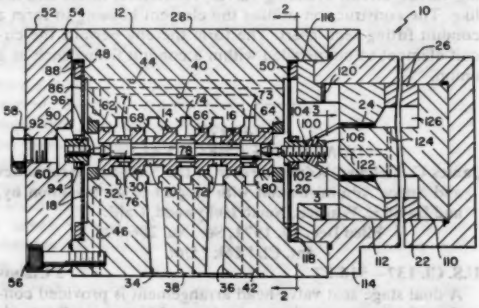
A low pressure, fast acting valve assembly employs a poppet valve member which can rapidly move between two positions in order to control the on-off operation of the valve. The valve inlet conduit is positioned so that primary fluid stream impinges directly on the inlet side surface of the poppet valve forcing the poppet valve to the opened position. A fluid passage centrally positioned in the poppet valve permits a portion of the primary fluid to pass through the poppet valve to a control chamber. When a control fluid is supplied to the valve assembly, the control chamber outlet is closed, and pressure within the control chamber causes a diaphragm to move the poppet valve to the closed position. The surface area of the diaphragm is substantially greater than that of the aforenoted inlet side surface of the poppet valve thus providing a pressure differential so the poppet valve can move against the force of the primary fluid stream. The control chamber outlet is controlled by a diaphragm mechanism, so that a very low pressure control fluid can control the flow of the relatively high pressure primary fluid. With the poppet valve in the closed position, the outlet conduit is in communication with an exhaust conduit which permits reverse flow from the outlet conduit to the exhaust conduit.

3,749,128

HIGH FREQUENCY RESPONSE SERVO VALVE

David W. Sallberg, Farmington; Peter I. Clark, Troy; Wesley R. Parker, and Robert D. Nicholson, both of Birmingham, all of Mich., assignors to Koehring Company, Milwaukee, Wis.

Filed Apr. 8, 1971, Ser. No. 132,276
Int. Cl. F16k *31/10*; F15b *11/08*
U.S. Cl. 137—625.61 **11 Claims**



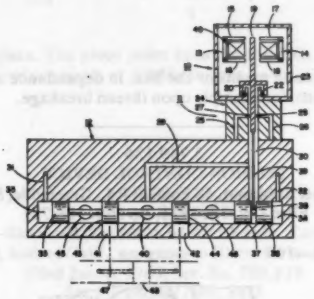
Metering means for hydraulic fluid including a metering sleeve and a spool valve within the sleeve movable to meter

fluid through the sleeve in accordance with the position of diaphragm springs engaged therewith at the opposite ends thereof, a voice coil connected to one of the diaphragm springs and means for creating a permanent magnetic field about the coil whereby high frequency movement of the voice coil and therefore the spool valve is effected by varying the electric signal in the coil.

3,749,129
DRY TORQUE MOTOR SERVO VALVE

Elias J. Amdur, Saint Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1971, Ser. No. 210,060
Int. Cl. F15b *9/00*; F16k *11/07*
U.S. Cl. 137—625.62 7 Claims

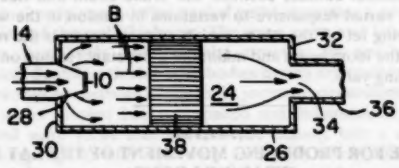


A servo valve is disclosed having a dry electrical torque motor operating an armature which controls a flapper valve, an o-ring for sealing the dry torque motor from the flapper valve, a boost valve responsive to the output from the flapper valve, and a feedback spring responsive to the movement of the boost valve for repositioning the armature controlling the flapper valve. Moreover, the electrical torque motor includes a pair of low reluctant bars joining the like poles to increase the electromotive force exerted upon the armature.

3,749,130
FLOW DEFLECTOR FOR EXHAUST GASES

John S. Howitt, Horseheads, and Richard B. Pitbladdo, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 25, 1971, Ser. No. 146,653
Int. Cl. F15d *1/00*
U.S. Cl. 138—42 7 Claims

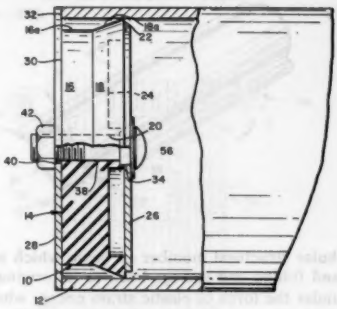


A deflector member is positioned within the flow of exhaust gases being discharged from the exhaust pipe of an internal combustion engine into a chamber of greater transverse cross-section than said exhaust pipe and containing a flow-through catalyst support, so as to deflect the high velocity discharge stream and provide a substantially uniform flow front as the exhaust gases approach the flow-through catalyst support within said chamber.

3,749,131
END PLUG ASSEMBLY FOR PIPE

Edwin M. Burger, Walnut Creek, Calif., assignor to Oliver Tire & Rubber Company, Oakland, Calif.

Filed July 21, 1971, Ser. No. 164,534
Int. Cl. F16l *55/10*; A47k *1/14*
U.S. Cl. 138—89 2 Claims

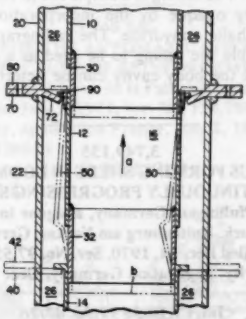


A plug assembly for sealing the open end of a pipe such as an unused lateral of a fluid conduit comprises a circular sealing member of elastomeric material supported between a pair of washer plates of different diameters. Means are provided for holding the washers in place and for drawing them together to compress the sealing member. When the washer plates are drawn together the sealing member is caused to deform and bulge outwardly to form a sealing peripheral contact with the inner pipe wall.

3,749,132
CHIMNEY

Zygmunt J. Prezewalski, 22 Brewster Rd., Windsor, Conn.

Filed May 24, 1972, Ser. No. 256,572
Int. Cl. F16l *9/18*
U.S. Cl. 138—113 5 Claims



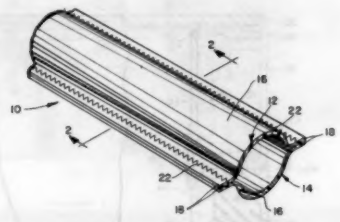
A chimney formed from a plurality of modular sections and defining a central annulus-shaped passage as a flue and an outer surrounding air or insulating passage formed by a pair of concentrically arranged inner and outer walls with compensating means allowing for dimensional changes in the walls of the modular sections resultant from temperature variations.

3,749,133

STRAIN ENERGY ERECTILE TUBULAR BEAM WITH STITCHED FLANGES

Michael Bochory, Los Angeles, Calif., assignor to FRW Inc., Redondo Beach, Calif.

Filed Apr. 2, 1971, Ser. No. 130,574
Int. Cl. F16l *11/14*
U.S. Cl. 138—119 1 Claim



A tubular structural member or beam which may be flattened and folded and springs back to its original expanded shape under the force of elastic strain energy when released. The beam is composed of two mirror image half sections constructed of relatively thin resiliently flexible sheet material and having confronting arcuate wall portions forming a tube and contacting outwardly directed flanges along the longitudinal edges of the wall portions pivotally joined to one another by rows of stitching which permit the flanges to rotate away from one another and thereby reduce or eliminate binding stress and resultant creep along the junctures between the flanges and arcuate wall portions when the beam is flattened, whereby the beam may be retained in the folded configuration for a prolonged period of time without adversily effecting its ability to spring back to its original expanded shape.

3,749,134

RADIOGRAPHICALLY OPAQUE PLASTIC TUBING

Eugene L. Slingluff, East Troy, and Eli Ostoich, Milwaukee, both of Wis., assignors to Sunlite Plastics, Inc., Milwaukee, Wis.

Filed Feb. 2, 1972, Ser. No. 222,983
Int. Cl. F16l *11/06*; G21f *1/10*
U.S. Cl. 138—177 7 Claims

Flexible radiographically opaque plastic tubing for use as an X-ray catheter. The tubing is transparent to visible light and is rendered X-ray opaque by the incorporation of a diol of tetrabromophthalic anhydride. The radiographically opaque properties enable the tubing to be used as a catheter whose position within the body cavity can be determined by X-ray observation.

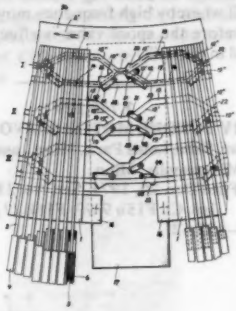
3,749,135

APPARATUS FORMING SHEDS IN LOOMS HAVING CONTINUOUSLY PROGRESSING SHEDS

Adolf Linka, Pfullingen, Germany, assignor to Fouquet-Werk Frauz & Planck, Rottenburg am Neckar, Germany

Filed Dec. 14, 1970, Ser. No. 97,550
Claims priority, application Germany, Dec. 17, 1969, P 19 63 208.7
Int. Cl. D03d *37/00*, *47/26*
U.S. Cl. 139—13 17 Claims

The heddles are moved by means of operating elements, such as push-rods or jacks, the movement of which are controlled by butts engaging in guide tracks. Diverters, or deflectors are arranged within the guide tracks to cause movement of the butts in predetermined grooves of the guide tracks, for normal operation, or, in case of bypass of the shuttle, to divert the butts into a parallel branching track which moves the heddles into non-weaving position. The diverters are formed as deflection elements which can be controlled by electromagnetic, pneumatic means or the like, in dependence on operating conditions, for example upon thread breakage.

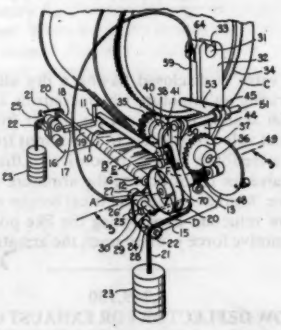


3,749,136

TENSION CONTROL DEVICE

David Everett Robinson, 42 Foxhall Rd., Greenville, S.C.

Filed Oct. 13, 1971, Ser. No. 188,721
Int. Cl. D03d *49/08*, *49/10*
U.S. Cl. 139—109 10 Claims



A tension control device in the form of a let-off for a loom beam or the like is disclosed for varying the speed of rotation of the beam to maintain constant tension in the warp yarn as the yarn is removed from the beam. The let-off includes a brake drum with a band extending therearound in operative association with the loom beam and a sensing means, whereby the frictional contact between the brake drum and flexible band is varied responsive to variations in tension in the warp yarn being let off the beam, which, in turn, controls the rotation of the loom beam and maintains a constant tension on the unwinding yarn.

3,749,137

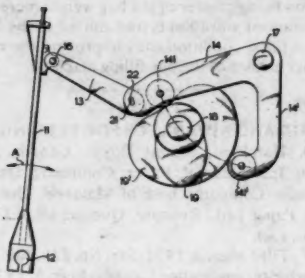
DRIVE FOR PRODUCING MOVEMENT OF THE LAY IN WEAVING LOOMS

Hans Jager, Munster, Germany, assignor to Emil Jager KG, Munster, Germany

Filed Dec. 20, 1971, Ser. No. 209,993
Claims priority, application Germany, Jan. 15, 1971, P 21 01 720.9
Int. Cl. D03d *49/60*
U.S. Cl. 139—190 10 Claims

For producing greater retardation at the outer dead end of the movement of a lay, a double lever system includes links pivoted to each other with one pivoted to the lay and the other

to the loom frame. The second link forms one arm of an angle member, each arm of which carries a roller engaging one of



two cam discs. The pivot point between the links can be adjusted to produce single or double strokes.

3,749,138

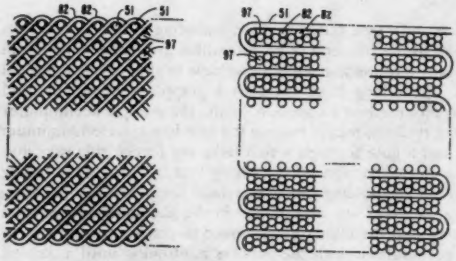
THICK FABRICS

Walter A. Rheaume, Fullerton, and Arthur R. Campman, Los Angeles, both of Calif., assignors to Hitco, Irvine, Calif.

Filed Jan. 6, 1969, Ser. No. 789,219

Int. Cl. D03d 11/00, 3/02

U.S. Cl. 139—408 **7 Claims**



Fabrics in accordance with the invention are characterized by densely woven bodies of substantial thickness, in which individual warp yarns define angled paths traversing a principal portion of the wall thickness. The warp yarns and lateral fill yarns completely interlock the structure in non-laminar fashion. Seamless thick walled bodies having selectable shapes are woven by methods in which fill yarns are circumferentially fed under tension between spaced and independently controlled warp yarns that are directed radially into a central weaving region, with new warp yarn ends being selectively added. Frustums and other hollow bodies may be woven with progressively increasing diameter, with fill yarns circumferentially disposed about the central axis and warp yarns traversing paths within planes substantially parallel to the central axis, new warp yarn planes being added as the diameter of the body increases. Solid cylindrical shapes may employ a unitary structure defined by a plurality of substantially like segments of a cylinder, each segment having a number of warp planes extending radially and terminating at the outer surface of the cylinder, but having a different selected radial length, with the fill yarn being disposed in substantially concentric or spiral fashion within the cylinder.

3,749,139

WEAVING METHOD FOR THE PRODUCTION OF MULTI-COLORED RIBBONS AND ASSOCIATED SHUTTLE-TYPE JACQUARD RIBBON LOOMS

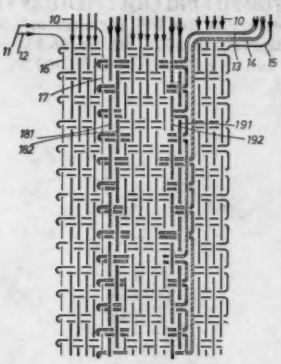
Ewald Rath, Wuppertal-Ronsdorf, Germany, assignor to Carl Luedorf & Company, Wuppertal-Ronsdorf, and W. Schueller & Sohn, Wuppertal-Wichlinghausen, both of Germany

Filed Oct. 4, 1971, Ser. No. 186,266

Claims priority, application Germany, Oct. 21, 1970, P 20 51 572.4

Int. Cl. D03d 23/00, 35/00

U.S. Cl. 139—416 **1 Claim**



Weaving method for the production of multi-colored ribbons in any desired geometrical figures and color patterns on a shuttle-type Jacquard loom by utilizing a ground warp and differently colored threads, to be interlaced as weft to form the ground and figures, wherein the multi-colored threads for forming the ground and the geometrical pattern are supplied in the warp direction and are picked into the ground warp in the form of weft threads by a plurality of shuttle threads as an insertion weave while the working threads are entrained with the ground warp. These working threads are distributed in accordance with the width of the colored figures on which the differently colored threads are interlaced, one of the shuttle threads inserting the thread which forms the ground weft while the remaining shuttle threads interlace one or more colored threads, either for figures which are disposed in the middle of the ribbon or for figures which extend into the outer ribbon zones.

3,749,140

MACHINE FOR THE AUTOMATIC CONTINUOUS MANUFACTURE OF REINFORCEMENTS

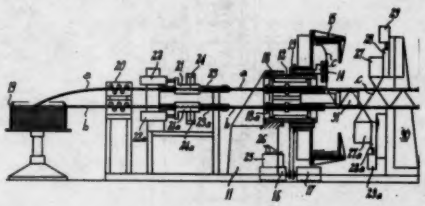
Maurice E. Debry, 25-33, rue de la Paix, Vincennes, France

Filed July 1, 1971, Ser. No. 158,708

Claims priority, application France, July 2, 1970, 7024515; June 2, 1971, 7120014

Int. Cl. B21f 27/10

U.S. Cl. 140—71 R **5 Claims**



A machine for automatically and continuously manufacturing reinforcements comprising longitudinal metal members

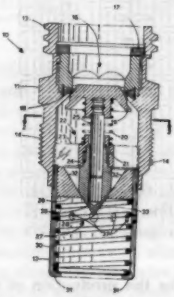
connected by at least one transverse member and comprising a cylindrical bearing mounted on the machine frame and rotatably mounting a drum which carries the transverse member and a wire guide. The drum and wire guide are rotatable about the same axis. The machine also includes devices for drawing the longitudinal members off a store and devices including barrels for moving them parallel to said axis in the direction of the drum. Control means is provided for correlating movement of the longitudinal members with drum rotation to produce a helical binding of the transverse members about the longitudinal members.

3,749,141

PROCESS FOR FILLING LIQUEFIED GAS VESSELS

Owen L. Garretson, P.O. Box 108, Farmington, N. Mex.

Filed July 20, 1970, Ser. No. 56,334
Int. Cl. B65b *31/00*; B67c *3/02*
U.S. Cl. 141—5 **2 Claims**



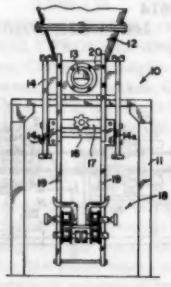
A process and mechanism for filling liquefied gas vessels to increase the filling speed and decrease the build-up of pressure within the vessel by forming the incoming liquid into a solid stream with a controlled velocity to stir the contents of the vessel and mix the incoming liquid with the liquid already in the vessel; the mechanism for controlling the velocity of the incoming liquid comprising a check valve which opens as the liquid gas flow rate increases and closes as the flow rate decreases to provide a lower limit on the velocity of the liquid gas entering the vessel without an excessively high velocity at high flow rates.

3,749,142

BAG SETTLER FOR BAG FILLING MACHINES

Erwin M. Lau, Dolton, Ill., assignor to Black Products, Inc., Chicago, Ill.

Filed Apr. 16, 1971, Ser. No. 134,575
Int. Cl. B65b *1/22*
U.S. Cl. 141—73 **8 Claims**



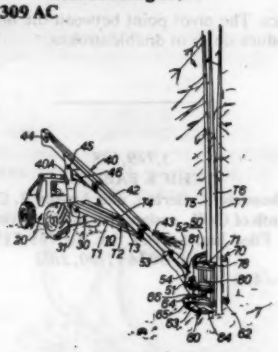
The saddle member of a settler is mounted on a lever fulcrumed on a mounting plate assembly. The other end of the lever is connected to a vertically reciprocating crank rod. The crank rod is driven from a drive shaft by an eccentric cam mounted on the drive shaft and a yoke on the crank rod so that it reciprocates with a harmonic motion. Interposed between the lever end and the crank rod are two springs, one located above the lever and one below. The springs tend to absorb a portion of the reciprocating motion of the crank, the amount of absorption being greater of the bag weight increases. Thus a smaller amount or vibration is transmitted to the bag as it approaches its filled condition thus improving the operation of the scale mechanism of the bag filling machine.

3,749,143

METHOD AND APPARATUS FOR FELLING TREES

Douglas D. Hamilton, Mount Royal, Canada, assignor to Canadian International Paper Company; Quebec North Shore Paper Company, both of Montreal, Quebec; Abitibi St. Anne Paper Ltd., Beaupre, Quebec, all of Canada; part interest to each

Filed Mar. 2, 1971, Ser. No. 120,300
Claims priority, application Canada, Mar. 3, 1970, 076349
Int. Cl. A01g *23/08*
U.S. Cl. 144—309 AC **22 Claims**



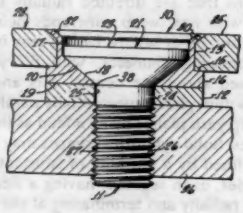
A mobile tree feller skidder including a felling head attached to the free end of an extendible and retractable boom pivotally mounted on a mobile vehicle to slew about a vertical axis. The felling head includes a grapple accumulator and shear mounted on a common frame, the grapple accumulator having resilient means biasing the bite to a selected minimum size and a gate through which trees are forced sideways into the accumulator against the spring bias by forcing the felling head onto a standing tree of the shear jaw in an open position. A tree or trees are first placed in the accumulator and then severed and the felling head moved to place a further tree in the accumulator with the process continuing until a desired number of trees are collected in the accumulator and then felled, depositing the butt end of the collected trees on a tong-type bunk, mounted on the vehicle.

3,749,144

CAPTIVE SCREW FOR THIN PANELS

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Filed Aug. 26, 1971, Ser. No. 175,056
Int. Cl. F16b *41/00*
U.S. Cl. 151—69 **9 Claims**



A captive screw device that includes a collar having a relatively thin wall at one end and an exterior shoulder at the

other, the bore of the collar having a first cylindrical portion connecting to a second frustoconical portion, a screw extending through the collar with the undersurface of the head complementarily engageable with the surface of the collar at the second portion of the bore, the shank of the collar extending outwardly beyond the collar and receiving a washer, the shank having threads beyond the washer which have a larger major diameter than the opening through the washer for retaining the screw in the collar and preventing substantial relative axial movement, the thin-walled portion of the collar being bendable outwardly into a frustoconical recess to form a flange for securing the collar to a workpiece.

3,749,145

PNEUMATIC TIRES

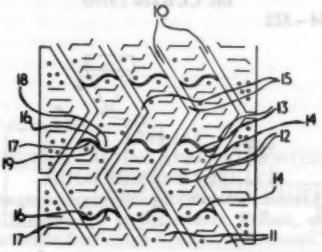
Claude A. Hart, Sutton Coldfield, and Eric W. Haycock, Alrewas near Burton-upon-Trent, Staffordshire, both of England, assignors to Dunlop Holdings Limited, London, England

Filed June 10, 1971, Ser. No. 151,706

Claims priority, application Great Britain, June 13, 1970, 28,724/70

Int. Cl. B60c *11/06*

U.S. Cl. 152—209 R **15 Claims**



A pneumatic tire having a breaker, particularly of steel cord fabric and circumferential tread ribs provided with transverse slots extending across the whole or a major portion of the rib width to separate areas of tread rubber which will interlock to resist a sideways force applied to the tire, of which the following is a specification.

3,749,146

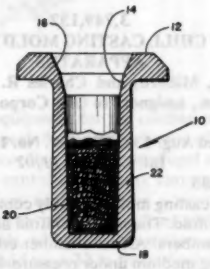
TIRE STUD

Charles J. DeCaro, Chesterland, Ohio, assignor to Textron, Inc., Providence, R.I.

Filed Mar. 27, 1972, Ser. No. 238,164

Int. Cl. B60c *11/16*

U.S. Cl. 152—210 **7 Claims**



An improved tire stud including a head portion and a shank portion is closed by a relatively thin end portion. A blind bore extends from an opening in the head portion through the shank to the end portion. Bonded particulate abrasive material fills at least a part of the bore adjacent the end portion. A method for making the tire stud is disclosed.

3,749,147

VEHICLE SCREEN

Marlin F. Hess, and Grace A. Hess, both of 4531 Mayberry St., Omaha, Nebr.

Division of Ser. No. 63,158, Aug. 12, 1970, Pat. No. 3,670,798. This application Jan. 20, 1972, Ser. No. 219,422

Int. Cl. E06b *9/00, 9/52*

U.S. Cl. 160—354 **2 Claims**

A screen device for vehicle windows comprising a screen material which is secured to the vehicle so that the screen material is positioned at the outside surface of the window. One form of the invention comprises a metal screen material having a flexible attachment means secured thereto which extends around the upper, forward and rearward portions of the vehicle door. The attachment means includes a draw string which is secured to the vehicle door to securely draw the device adjacent the window. The attachment means may also include a flexible magnet means at the lower edge thereof which holds the lower end of the device on the exterior surface of the vehicle door below the window. A second form of the invention relates to a flexible sleeve or boot comprised of netting material which extends over both sides of the upper end of the vehicle door to provide a screen on both sides of the window. A third form of the invention is disclosed which is similar to the second form except that the flexible netting material is positioned only at the outside surface of the window. A fourth form of the invention pertains to a flexible netting material having a magnetic attachment means extending around the border thereof to facilitate the attachment of the device to the exterior surface of a station wagon at the rear side window area. A fifth form of the invenion is also disclosed and is similar to the fourth form with a magnet means being employed thereon for aiding in attaching the screen to the vehicle. A sixth form of the invention is disclosed which is adapted to be mounted at the rear window area of a station wagon.

3,749,148

HOT TOPPING METHOD

Edward John Jago, Berea, Ohio; Fred Eastwood, late of Bay Village, Ohio (by Ann Eastwood, executrix), and W. Donald Todish, Medina, Ohio, assignors to Foseco International Limited, Birmingham, England

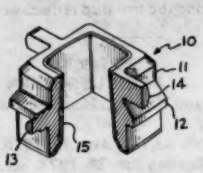
Filed Oct. 1, 1969, Ser. No. 863,760

Int. Cl. B22c *9/12*

U.S. Cl. 164—33 **13 Claims**

A hot top method of the type in which reusable hot top casings are relined after each ingot casting. The relining is effected by advancing a plurality of casings in seriatim to fixed lining stations, at which an annular cavity is formed adjacent the inner surface of each casing, and then a slurry is fed into the cavity and the liquid carrier is withdrawn from the slurry to form a liner of solid materials on the inner surface of the casing. The slurry is formed by pulverizing a fibrous material and then mixing the pulverized fibrous material with a major

proportion of a finely divided refractory material at a pre-mixing station located remotely from the fixed lining station. The dry pre-mix is then transported to the lining stations and mixed with a liquid carrier to form the desired slurry.



3,749,149

METHOD AND AN ELECTRON-BEAM FURNACE FOR INGOT PRODUCTION

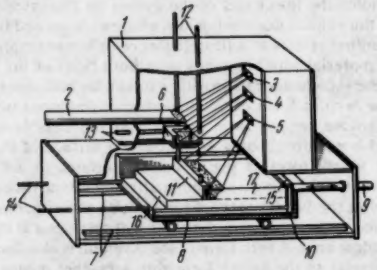
Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21, Kiev; Igor Stepanovich Pryanishnikov, oblast, Elektrostal, ulitsa Nikolaeva, 23, kv. 49, Moskovskaya; Boris Alexeevich Movchan, ulitsa Darvina, 7, kv. 7, Kiev; Vladimir Nikiforovich Zhuchin, ulitsa Sovetskaya, 2/102, kv. 27, Moskovskaya; Valentin Vasilievich Topilin, ulitsa Krasnaya, 40, kv. 5, Moskovskaya; Igor Vasilievich Perepelitsa, ulitsa Nikolaeva, 31, kv. 30, Moskovskaya; Alexei Lavrentievich Tikhonovsky, ulitsa Vernadskogo, 73, kv. 45, Kiev; Jury Anatolievich Kurapov, ulitsa Kapitanovskaya, 28, kv. 36, Kiev; Rostislav Spiridonovich Misjura, ulitsa Chudnovskogo, 2, kv. 22, Kiev, and Pavel Petrovich Kucherenko, ulitsa Gorkogo, 14, kv. 29, all of Kiev, all of U.S.S.R.

Filed May 3, 1971, Ser. No. 139,464

Claims priority, application U.S.S.R., June 15, 1970, 439143; June 15, 1970, 1439144

Int. Cl. B22d *27/02*

U.S. Cl. 164—50 **4 Claims**



The method of the present invention provides for melting a metal charge in an electron-beam furnace over a tundish and for solidifying molten metal in a mould the capacity of which is increased in a horizontal direction as it is filled with hot metal. The capacity of the mould is increased by moving its trough-shaped casing in a horizontal plane relative to its internal partition. In order to produce multi-layer ingots, the internal partition is lifted for a distance equal to the thickness of the previous solidified layer of the ingot. Electron-beam surface for realizing this method includes a vacuum chamber, a charger, and electron guns.

3,749,150

WHEEL TYPE CONTINUOUS CASTING MACHINE, FOR THE PRODUCTION OF A CONTINUOUS METAL INGOT

Ilario Properzi, Via-Vittor Pisani-8, Milano, Italy

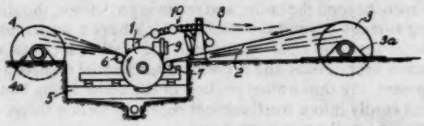
Filed June 18, 1971, Ser. No. 133,008

Claims priority, application Italy, Nov. 10, 1970, 31546 A/70

Int. Cl. B22d *11/06*

U.S. Cl. 164—87 **2 Claims**

A wheel type continuous casting machine for the production of a continuous metal ingot, comprising a peripherally grooved wheel driven by motor means, covered along an arc of a circle by a belt of notable length, fed to said wheel from a feeding reel and defining with said groove a mould on said wheel and passing onto a take-up reel during the rotation of the wheel, the belt being long enough to allow the machine to operate for at least one work shift.



3,749,151

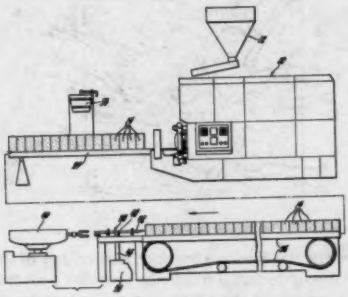
VIBRATORY SHAKEOUT APPARATUS

Michael D. George, Dayton; Dominick J. Varano; George K. Bronson, both of Defiance, all of Ohio; Nelson L. Kitchin, Warren, and William W. Rose, Jr., Ferndale, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 26, 1972, Ser. No. 247,612

Int. Cl. B22d *29/00*

U.S. Cl. 164—322 **7 Claims**



A vibratory shakeout apparatus including a pair of suspended, parallelly spaced, horizontally disposed vibrating rails mounted at the end of a continuously traveling conveyor carrying a row of contiguous, flaskless sand molds containing cast articles therein is disclosed. The vibrating rails pierce each of the molds and engage the casting therein as the molds are moved into the apparatus and advance the oriented castings to an end position on the rails, separating the sand therefrom, where the castings are removed from the apparatus by a programmed mechanical handling device.

3,749,152

DIRECT CHILL CASTING MOLD MANIFOLD APPARATUS

James E. Dore, Milford, and Charles R. McNutt, Hamden, both of , Conn., assignors to Olin Corporation, New Haven, Conn.

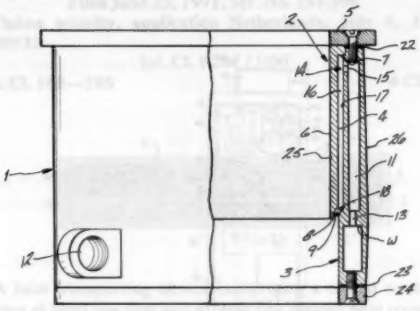
Filed Aug. 13, 1971, Ser. No. 171,461

Int. Cl. B22d *11/02*

U.S. Cl. 164—283 **40 Claims**

A direct chill casting mold assembly comprising a mold liner and a mold manifold. The mold manifold has at least two cooling medium chambers. A first chamber communicates with a source of cooling medium under pressure. Means are provided intermediate the first and second chambers for conducting the cooling medium from the first chamber to the second chamber. A substantial pressure drop is generally taken across the conducting means. Means are also provided which com-

municate with the second chamber for siphoning the cooling medium from the second chamber and applying it to a surface



of the mold liner. The pressure loss between the two chambers assures uniform water distribution about the mold liner periphery.

3,749,153

CENTRIFUGAL CASTING APPARATUS WITH CHILL MOLD HOLDING FURNACE

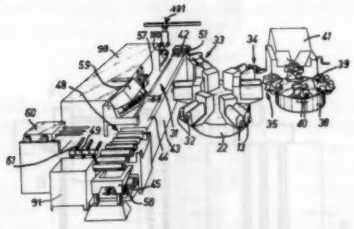
Jean G. Fauquembergue; Michel Lingrand; Henri Peltier, and Pierre Chatourel, all of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, and Automobiles Peugeot, Paris, both of France

Filed Nov. 15, 1971, Ser. No. 198,891

Claims priority, application France, Nov. 26, 1970, 7042528

Int. Cl. B22d *13/10*

U.S. Cl. 164—295 **8 Claims**



This composite equipment for the continuous manufacture of metal tubes, especially cylinder liners of internal combustion engines, according to the centrifugal casting method, comprises a rotary centrifugation tray carrying a plurality of centrifugation devices each receiving a centrifugation chill mold and registering by turns with a fixed station for loading the empty chill molds, with a casting station and with a fixed unloading station. Said trays **22** is driven for intermittent rotation and said loading and unloading stations constitute single station. A fixed dressing station is disposed angularly just downstream of this single station, and the casting station is supplied from a fixed source of molten metal.

3,749,154

LOW-PRESSURE DIE-CASTING APPARATUS AND DEVICE FOR PRE-PRODUCTION SETUP OF SAME

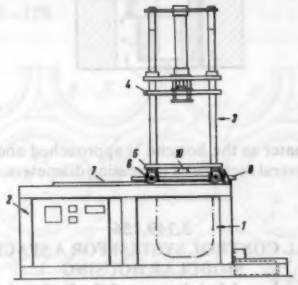
Alan Walter Plume, Hampton-on-Thames, England, assignor to A. W. Plume Limited, Twickenham, England

Continuation-in-part of Ser. No. 862,863, Oct. 1, 1969, abandoned. This application Jan. 10, 1972, Ser. No. 216,628

Claims priority, application Great Britain, Oct. 2, 1968, 46,684/68

Int. Cl. B22d *17/06*

U.S. Cl. 164—306 **10 Claims**



A low-pressure die-casting apparatus including a furnace framework, a furnace with a riser cap movably positioned in the framework, a rail or rails and a press which is adapted to translate on the rails from a position remote from the furnace to a casting position over the furnace. The rails are movable in the longitudinal direction and are provided with downward shaped portions and positioning stops adjacent the downward shaped portions. The press includes an upper and a lower platen. The lower platen has a bore which is adapted to engage the riser cap of the furnace. When the press is positioned above the furnace, it engages the downward shaped portions in the rails and the adjacent stops, and is thereby positioned and lowered over the furnace allowing the bore in the lower platen. The lower platen has a bore which is adapted to engage material may flow from the furnace to the press. The movable mounting of the press and the longitudinally movable rails provides adjustments for accurately aligning the bore in the lower platen, the casting die in the press and the furnace riser cap. A centering jig bar with a jig hole may be substituted for the casting die to allow pre-production adjustment of the die-casting apparatus.

3,749,155

EXCHANGE PROCESS

Jean-Pierre Buffiere, St Mande, France, assignor to L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed July 13, 1971, Ser. No. 162,047

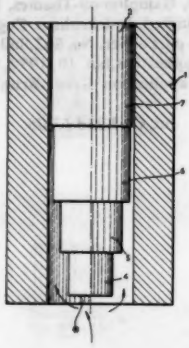
Claims priority, application France, July 16, 1970, 7026212

Int. Cl. F28f *1/40*

U.S. Cl. 165—1 **1 Claim**

An exchange process between a fluid which is to be heated and/or vaporized and circulating in a chamber, and an externally circulating liquid heating agent, in which the said chamber comprises means so that the speed of the fluid in the

hot exchange zone is higher than that of the fluid in the cold zone. These means consist of a mandrel, of which the diameter



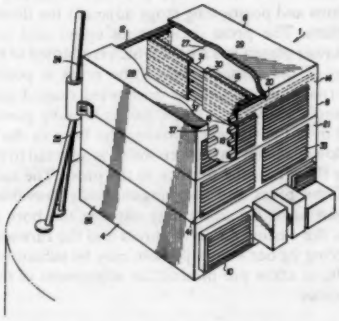
becomes greater as the hot end is approached and is possibly formed of several sections of increasing diameters.

3,749,156

THERMAL CONTROL SYSTEM FOR A SPACECRAFT MODULAR HOUSING

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert J. Eby, Gaithersburg, and Edward I. Powers, Silver Spring, both of Md.

Filed Apr. 17, 1972, Ser. No. 244,523
Int. Cl. G05d *23/00*; F28d *15/00*
U.S. Cl. 165—32 **9 Claims**



This disclosure includes a thermal control system for a spacecraft module wherein certain wall structures of said module are constructed of superinsulation and others of thermally conductive material, thermal louvres and a plurality of heat pipes to provide a path of heat transfer from the interior of the module to space permitting a relatively uniform temperature to be maintained throughout the module at all times with a relatively wide variation of the amount of heat dissipated by components within the module.

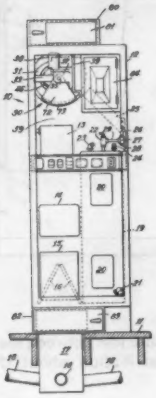
3,749,157

COMBINATION AIR HEATING AND COOLING APPARATUS FOR LIMITED SPACE INSTALLATIONS

Gerald M. Davison, Sycamore Bend, Union City, Mich.

Filed Oct. 21, 1971, Ser. No. 191,380
Int. Cl. F25b *29/00*
U.S. Cl. 165—48 **10 Claims**

A combination air heating and cooling apparatus suitable for use in installations where space is limited, having a conditioning chamber containing both a heating unit and a cooling unit, a blower which is rotatable alternatively to one of two limiting or rest positions, an air distributor assembly, and valve means cooperating therewith, the structure in one position being arranged to direct air downwardly over the heating unit



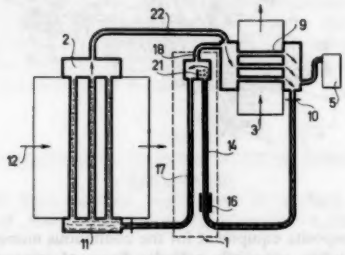
and through a downwardly directed plenum, while bypassing the cooling unit; and in the other position to direct air upwardly across said cooling unit, while bypassing the heating unit, and to direct the air thus cooled for being discharged upwardly from the apparatus.

3,749,158

HEAT EXCHANGE APPARATUS FOR THE UTILISATION OF THE HEAT CONTENT OF EXHAUST GASES

Josef Szabo, and Laszlo Szucs, both of Budapest, Hungary, assignors to Magyar Hajo-es, Budapest, Hungary

Filed Nov. 20, 1970, Ser. No. 91,242
Int. Cl. F28d *15/00*; F24d *1/00*
U.S. Cl. 165—96 **3 Claims**



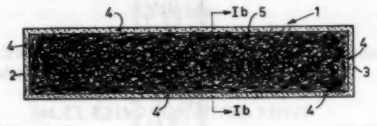
Heat transfer apparatus for the utilization of the heat content of exhaust gases includes two heat-exchangers linked by a closed circuit in which an intermediate medium circulates. There is a special device for restricting or stopping the flow of the intermediate medium which receives heat in one of the heat-exchangers from the hot exhaust gases and transfers it to the heat-receiving medium in the other heat-exchanger.

3,749,159

HEAT TRANSPORTING DEVICE

Roelf Jan Meijer, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 23, 1971, Ser. No. 155,996
Claims priority, application Netherlands, July 4, 1970, 7009932
Int. Cl. F28d 15/00
U.S. Cl. 165—105 4 Claims



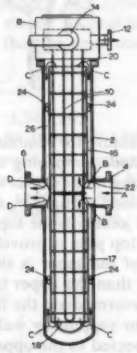
A heat transporting device comprising a closed container having at least one first and at least one second heat transmission wall, and a heat transporting medium which absorbs thermal energy through the first heat transmission wall while changing from the liquid phase into the vapor phase and supplies thermal energy to the second heat transmission wall while changing from the vapor phase into the liquid phase; the container furthermore comprises a porous mass which connects the second to the first heat transmission wall in such manner that the medium condensed through said mass on the second heat transmission wall can flow back to the first heat transmission wall due to capillary action. One or more supporting elements are arranged in the container for supporting the walls of the container against pressure forces exerted thereon from without, which supporting elements permit the flow of medium vapor in the direction of heat transport.

3,749,160

TUBE BANK HEAT EXCHANGER AND UNIT OF SUCH HEAT EXCHANGERS

Rasmus Vestre, Ljan, Oslo, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed July 1, 1970, Ser. No. 51,414
Claims priority, application Norway, July 4, 1969, 2817/69
Int. Cl. F28f 9/22
U.S. Cl. 165—143 3 Claims



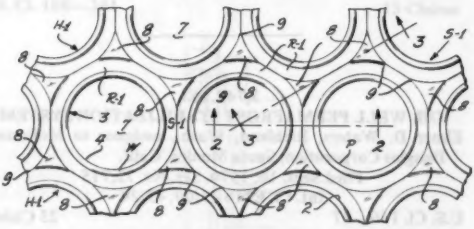
An improved elongated tube bank heat exchanger and a unit of such heat exchangers coupled in series for heat treatment of gas. The tube bank in the heat exchanger mantle is encompassed by a jacket extending coaxially through the mantle spaced from the inside of the mantle. The heat exchanger mantle is provided with two gas access openings positioned at the same cross-sectional plane on the mantle and substantially at the mid-point thereof. One of the accesses communicates directly with the inside of the jacket, the other access opening communicates with the spacing between the inside of the mantle and the outside of the jacket. The jacket is open at both ends, whereby the gas stream when introduced into one of the access openings is divided into two gas streams each of which flows in opposite directions through the heat exchanger, the streams turning at each respective end of the heat exchanger and being unified anew before leaving the heat exchanger.

3,749,161

TUBESHEET CONSTRUCTION

Charles L. Hibbeler, Mehlville, Mo., assignor to Nooter Corporation, St. Louis, Mo.

Filed Jan. 27, 1972, Ser. No. 221,338
Int. Cl. F28f 9/18
U.S. Cl. 165—178 10 Claims



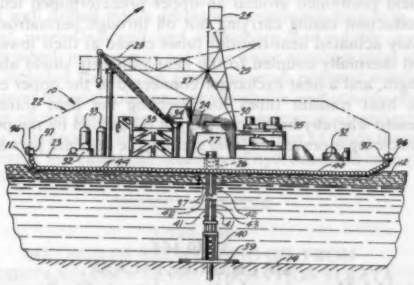
A tubesheet for a vessel, heat exchanger, or the like wherein each tube is welded in an opening in a tubesheet, there being a recess of special cross-sectional configuration circumscribing each opening, said configuration being such that no triangular portions remain between the openings in the tubesheet. Beyond a predetermined distance from each opening with this cross-sectional configuration, some metal from the tubesheet surface is removed at substantially every point by a tool which rotates about each opening. The end of the tube and the annular unrecessed portion of the tubesheet are welded together.

3,749,162

ARCTIC OIL AND GAS DEVELOPMENT

Edward O. Anders, Houston, Tex., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Apr. 1, 1971, Ser. No. 130,092
U.S. Cl. 166—.5 87 Claims



In performing oil and gas exploration and production operations in arctic regions in association with submerged well sites, a shallow draft barge equipped with appropriate mechanisms and devices is used. During periods when no ice is present over the submerged well site, the barge is moored over the

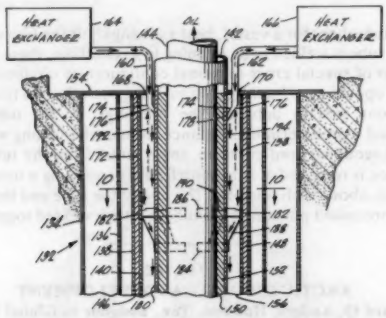
well site. During periods in which ice sheets overlie the submerged well site, the barge is buoyantly supported in a pool of water which communicates through the ice sheet. As the ice sheet moves laterally relative to the submerged well site, the position of the pool is moved in the ice sheet so that the location of the barge is maintained over the location of the submerged well site within limits appropriate to the nature of the operations being performed at the submerged well site. Movement of the water pool within the moving ice sheet is accomplished by melting the boundaries of the water pool lying between the barge and the direction from which the ice sheet moves toward the barge at a rate equal to the rate of movement of the ice sheet relative to the submerged well site. The barge is movable across the top of the ice sheet, or across water or land, to and from well site locations on a cushion of low pressure air. The barge may also be used as a land based site of oil or gas well drilling or production operations.

3,749,163

OIL WELL PERMAFROST STABILIZATION SYSTEM

Elmer D. Waters, Richland, Wash., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Sept. 16, 1970, Ser. No. 72,715
Int. Cl. E21b *43/00, 43/24*
U.S. Cl. 166—57 **25 Claims**



Oil well casing construction for installation in permafrost to convey hot oil and simultaneously provide for permafrost stabilization. The oil well permafrost stabilization system normally includes an insulated heat gathering surface member or shield positioned around an upper predetermined length of production casing carrying hot oil through permafrost, passively actuated heat transfer tubes closed at their lower ends and thermally coupled to the heat gathering shield along its length, and a heat exchanger connected to the upper ends of the heat transfer tubes for rejecting the heat transferred thereto whereby heat from the hot oil carried by the production casing is prevented from melting the adjacent permafrost.

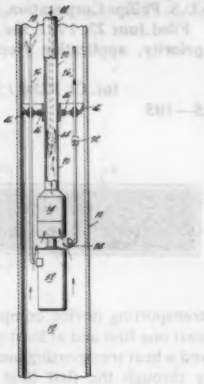
3,749,164

AIR CHARGER PACKER

Harold J. Moxey, Laurel, Miss., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest and Ray H. Moffett, Laurel, Mass., a part interest

Filed Nov. 22, 1971, Ser. No. 200,996
Int. Cl. E21b *43/00*
U.S. Cl. 166—68 **4 Claims**

An air charge packer for use with turbine or submersible pumps for pumping air, gas, in gaseous fluid below ground. The packer has means for controlling the input above ground which include floats, check valves or electric feeders. The input is used to pump water from a well into a storage tank.

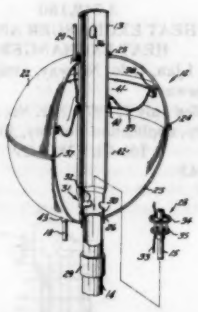


3,749,165

WELL SERVICE STRUCTURE

A. B. Heaton, Belding, Mich., assignor to Aqua Systems and Products of Michigan, Inc., Ionia, Mich.

Filed Mar. 10, 1972, Ser. No. 233,414
Int. Cl. E21b *33/03*
U.S. Cl. 166—88 **7 Claims**



A well service structure for remote positioning in respect to residences served and comprising a top pipe section connected to a wall casing that extends vertically downward. The top pipe is itself encased partially by a spherical resin tank cast in hemispheres and joined to the top pipe and to each other. The interior of the top pipe is provided with a taper portion, the lower portion of the taper is shouldered and is slightly smaller in diameter than the upper taper portion and the top pipe is perforated intermediate the limits of the tapered portion. A flow director supporting well pipe and pump is provided which is connected to the upper section of well pipe so that water from the well enters the distributor axially and is diffused radially through the perforations in the top pipe extension and into the spherical tank. The top plate closure of the flow director includes a taper faced ring seal and the lower plate closure on the flow director includes a similar but smaller taper faced seal and both are seated on the tapered portion provided in the top pipe. In addition, a flange portion of the taper faced seal rests on an internal shoulder provided in the top pipe. The spherical tank is provided with a resilient membrane in the upper portion which separates the tank into two parts, the part below the membrane being vented to at-

mosphere via a bent tube and the lower part is provided with a delivery nipple connectable to a remote use facility. The tank is preferably buried and in some situations, may be housed above ground and preferably remote from the residence or dwelling served. The upper portion of the top pipe extends above the ground and is preferably closed by a protective clousre but may be selectively opened to permit axial removal of flow director, well pipe, pump, strainers, foot valves, and the like.

3,749,166

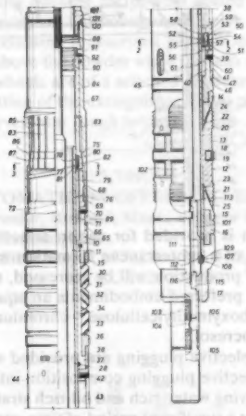
WELL PACKER APPARATUS

David E. Young, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 26, 1972, Ser. No. 257,405

Int. Cl. E21b *23/06, 33/128, 33/129*

U.S. Cl. 166—123 **20 Claims**



In accordance with an illustrative embodiment of the present invention, a well packer apparatus includes a mandrel that carries normally retracted slips and packing elements that can be expanded to provide an anchored pack off in a well. Separate lock systems are provided to lock the slips and the packing in set positions, and the lock systems can be disabled by selectively operable means to enable retraction of the packing and the slips so that the apparatus can be retrieved, intact, to the surface.

3,749,167

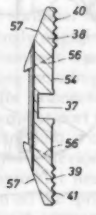
WELL TOOL ANCHORING APPARATUS

David E. Young, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 26, 1972, Ser. No. 257,086

Int. Cl. E21b *23/06*

U.S. Cl. 166—217 **12 Claims**



In accordance with an illustrative embodiment of this invention, an anchoring system for a retrievable well tool includes unitary slip elements that are expanded and retracted by the movement of associated slip expanders in opposite longitudinal directions. The expanders and slip elements have companion inclined expander surfaces and oppositely disposed retractor surfaces with the angle of inclination of the retractor surfaces being substantially greater than the angle of inclination of the expander surfaces to prevent binding during expansion of the slip elements.

3,749,168

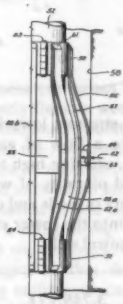
WELL CENTRALIZER

John A. Hall, Sr., Weatherford, Tex., assignor to Weatherford Oil Tool Company, Inc., Houston, Tex.

Continuation of Ser. No. 688,188, Dec. 5, 1967, abandoned, which is a continuation-in-part of Ser. No. 577,364, Sept. 6, 1966, Pat. No. 3,643,739. This application Oct. 13, 1972, Ser. No. 297,224

Int. Cl. E21b *17/10*

U.S. Cl. 166—241 **13 Claims**



The centralizer consists of axially-spaced collars connected usually by groups of bowed leaf springs for slidable reception upon a casing or other pipe extending into a well. At least one group of springs is for engaging the surrounding well wall, while the other springs, which may be prestressed or of different resistance to flexing, serve, primarily, to increase the bending resistance of the first group of springs.

3,749,169

SECONDARY RECOVERY PROCESS

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 82,187, Oct. 19, 1970, abandoned. This application June 25, 1971, Ser. No. 157,050

Int. Cl. E21b *43/22, 43/27*

U.S. Cl. 166—271 **18 Claims**

Significant improvement in the recovery of hydrocarbons from a subterranean hydrocarbon-bearing calcareous formation is accomplished by injecting into the formation via an injection well drilled into a formation communicating with an adjacent producing well and containing acid-soluble components which may or may not have water-sensitive clays and shales included therein, an acidic aqueous polymer solution whereupon the acid solution reacts with the acid-soluble components of the formation creating passageways or enlarging existing passageways thus facilitating the flow of fluids therein and thereby increasing the recovery of hydrocarbons from the formation through the adjacent producing well.

3,749,170

METHOD OF RECOVERING OIL FROM SUBSTANTIALLY LEVEL FORMATION STRATA

Frederick W. Riehl, 2347 Albion St., Denver, Colo.

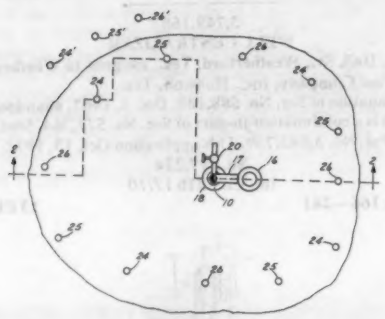
Filed Mar. 1, 1972, Ser. No. 230,577

Int. Cl. E21b *43/24*

U.S. Cl. 166—272 **12 Claims**

A method for primary or secondary recovery of petroleum fluids from substantially level strata, and especially in formations where poor bottom hole pressure conditions are encoun-

tered, comprises providing a central cased well extending into a permeable stratum lying between two impermeable strata, providing a plurality of cased wells spaced at substantial distances from and extending in a ring or other configuration about the central well, providing communication between each of the plurality of wells and a respective permeable



stratum above the first stratum, lowering the pressure in the central well to produce a flow of gaseous or liquid fluids toward the central well, utilizing high temperature steam and injection nozzles in said plurality of wells to aid the flow of fluid through the plurality of wells and downwardly from each respective stratum and into the lower stratum, and producing the fluids through the central well.

3,749,171

DECREASING THE PERMEABILITY OF SUBTERRANEAN FORMATIONS

John W. Marx, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 17, 1971, Ser. No. 116,217
Int. Cl. E21b *33/13, 43/16*
U.S. Cl. 166—274 **23 Claims**

A method for selectively decreasing the permeability of a subterranean formation of nonuniform permeability wherein there is injected into said formation a suspension of finely divided particles or granules of a permeability reducing agent. The largest particle or granule in said suspension has a particle size which is larger than the median pore size but significantly smaller than the largest pore size in said formation.

3,749,172

METHODS OF USING GELLED POLYMERS IN THE TREATMENT OF WELLS

James E. Hessert, and Richard L. Clampitt, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1972, Ser. No. 224,915
Int. Cl. E21b *43/22, 21/04*
U.S. Cl. 166—274 **26 Claims**

Improvements in secondary recovery operations for the recovery of oil, and improvements in well drilling operations, are accomplished through the use of aqueous mediums comprising aqueous gels prepared from strong brines and certain polyacrylamides and related polymers.

3,749,173

DISPLACEMENT OF DRILLING FLUIDS FROM BOREHOLES

Donald G. Hill; Charles F. Smith, and Clare H. Kucera, all of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 30, 1972, Ser. No. 257,832
Int. Cl. E21b *21/00, 33/14, 33/16*
U.S. Cl. 166—291 **7 Claims**

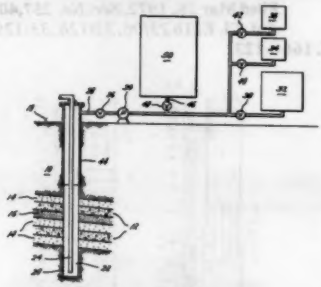
A method is disclosed for displacing drilling muds from boreholes. In the method, an organic liquid, gelled with a metal salt of an aliphatic substituted orthophosphate ester, is pumped into the hole through the casing or annulus to force the drilling mud out through the annulus or casing.

3,749,174

METHOD FOR SELECTIVE PLUGGING OF WELLS

Robert H. Friedman; Julianne D. Krause, and William R. Bradford, all of Houston, Tex., assignors to Getty Oil Company, Los Angeles, Calif.

Filed June 11, 1971, Ser. No. 152,277
Int. Cl. E21b *33/138*
U.S. Cl. 166—294 **8 Claims**



A composition is provided for use in selectively plugging water-rich strata of a subterranean formation so that the oil-to-water ratio of production will be increased, said composition including in preferred embodiments an aqueous solution of sodium carboxymethylcellulose, chromium potassium sulfate, and orthocresol.

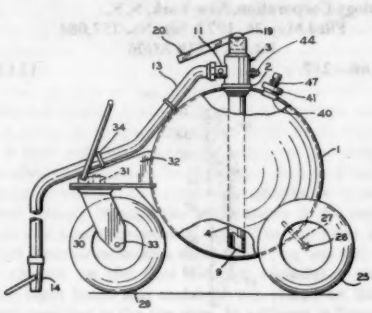
Methods for selective plugging are provided which include injection of a selective plugging composition into subterranean formations having water-rich and oil-rich strata whereupon the material, after a significant period of time, assumes a much greater viscosity in the water-rich strata. Pretreatment and post-treatment options are provided for improving results under certain conditions.

3,749,175

EMERGENCY FIRE EXTINGUISHER

James C. Bower, North Olmstead, Ohio, assignor to Atomic Fire Equipment Co.

Continuation-in-part of Ser. No. 824,797, May 15, 1969, abandoned. This application Apr. 10, 1970, Ser. No. 27,366
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 P **15 Claims**



The extinguisher comprises a sealed spherical tank precharged with dry fire extinguishing powder and gaseous media under pressure sufficient to expel the power through a

syphon tube. The tube has an inlet near the tank bottom and an outlet connected to a control valve on the top of the tank. A relatively short discharge hose having a dispensing nozzle at its discharge end controlled by a manual valve is connected to the valve.

Three wheels support the tank. They are arranged in a triangular pattern, the front wheel being a caster having an upright swivel axis disposed forwardly of the tank. The extinguisher is small enough to be hand propelled and steered by one man by pulling on the hose.

The discharge hose is secured to the caster wheel bracket close to the swivel axis of the caster wheel and close to the level of the center of gravity of the extinguisher so that, as the extinguisher is pulled and steered by the hose, caster wheel foremost, the line of pull is constrained to pass substantially through the swivel axis and below the center of gravity of the extinguisher.

The tank has a check valve for admitting precharging gaseous media into the tank through the syphon tube, and near its top has a filling opening for powder sealed by a detachable cap. The cap has an additional check valve operable for admitting and releasing pressurized gaseous media, selectively, from a level above the powder while the tank remains upright.

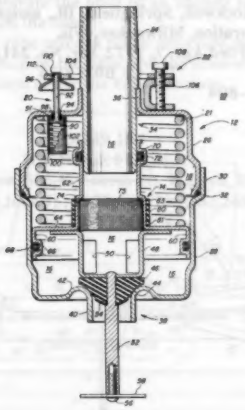
All of the wheels are of a selected diameter large enough to prevent upsetting of the extinguisher as it is pulled and steered by the hose, even over rough terrane.

3,749,176

AUTOMATIC ON-OFF SPRINKLER HEAD

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Filed May 3, 1971, Ser. No. 139,444
Int. Cl. A62c *37/06*
U.S. Cl. 169—37 **20 Claims**



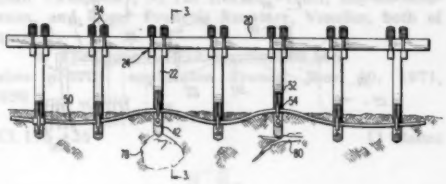
An automatic on-off sprinkler head including a housing, a movable partition sealingly engaging the housing for dividing the housing into two chambers: a primary chamber and a control chamber, the housing including an inlet port in the primary chamber adapted for connection with a source of fire quenching fluid and an outlet port in the primary chamber for dispensing fire quenching fluid, a control valve in the control chamber, a heat-responsive device for operating the control valve to turn on the sprinkler head above a predetermined temperature and to turn off the sprinkler head below that temperature, a valve element connected with the partition for closing the outlet port, biasing means for producing a force on the partition to urge the valve element to close the outlet port, and a passage interconnecting the primary and control chambers for enabling equalization of the pressure therein.

3,749,177

AGRICULTURAL IMPLEMENT

Merle D. Keyser, and Howard R. Jones, Jr., both of Bartlesville, Okla., assignors to Five Star Engineering, Inc., Dewey, Okla.

Filed July 23, 1970, Ser. No. 57,716
Int. Cl. A01b *39/19*
U.S. Cl. 172—44 **21 Claims**



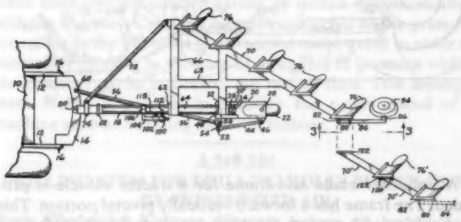
Agricultural implement comprises a rod weeder including an inarticulate, resiliently flexible weeder rod which is drawn through the soil. The resilient flexibility of the weeder rod is of a magnitude to maintain the rod substantially free of soil accumulation. The structure is marked by absence of means for driving the weeder rod in rotation about its longitudinal axis. The weeder rod is mounted on rod holders, each of which includes a bracket and a rod bearing. The rod bearing moves along an upright track on the bracket, and can be selectively locked at various heights so that the working depth of associated earthworking equipment can be adjusted while the weeder rod working depth is maintained at a constant value.

3,749,178

TWO WAY GANG PLOW WITH VARIABLE NUMBER BOTTOMS

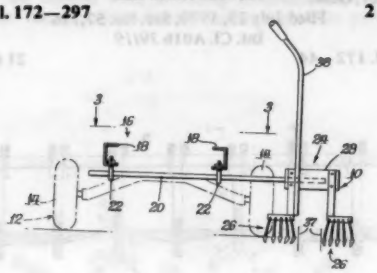
Glen A. Watts, Rt. 1, Box 258, McMinnville, Oreg.

Filed Sept. 23, 1971, Ser. No. 183,212
Int. Cl. A01b *3/28*
U.S. Cl. 172—225 **10 Claims**



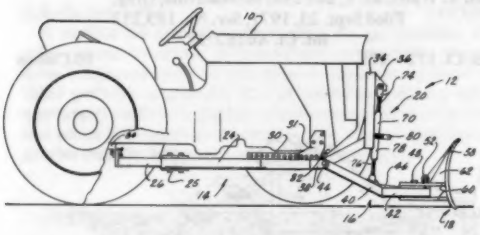
An elongated support beam, arranged for connection at its front end to a pulling tractor and supported at its rear end by a vertically adjustable carrier wheel, pivotally mounts a framework carrying a pair of plow gangs. The gangs are disposed on a line disposed obliquely to the support beam and extending rearward of the carrier wheel and are rotatable with the framework to position each gang selectively in its ground working position. A pair of tail wheels, one associated with each gang, is mounted detachably at the trailing end of the gangs for rotation therewith. Additional plow bottoms may be added to the trailing end of the gangs by detaching the pair of tail wheels and attaching the latter to the trailing end of the added plow bottoms. Means may be provided for rendering the carrier wheels steerable in response to turning of the tractor.

3,749,179
GARDEN CULTIVATOR
Arlie Hartman, Box 47, Mentone, Ind.
Filed Mar. 4, 1971, Ser. No. 120,915
Int. Cl. A01b 63/24
U.S. Cl. 172—297 2 Claims



A cultivator particularly adapted for use in a garden or acreage, mountable on a tractor, the cultivator extending from one side of the tractor and ahead of and under direct observation of the operator, and including means manually manipuable by the operator for controlling the cultivator in its engagement with the ground. The device is mountable merely by sliding a shaft laterally into a pair of eye bolts, and it is held in place by friction.

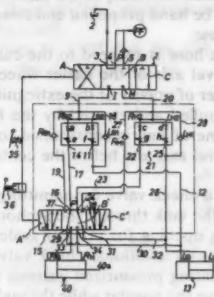
3,749,180
BULLDOZER ATTACHMENT FOR TRACTORS
John G. Coontz, Box 104, Kiowa, Kans.
Filed Dec. 27, 1971, Ser. No. 211,946
Int. Cl. E02f 3/76
U.S. Cl. 172—801 4 Claims



A bulldozer blade and frame for a tractor vehicle is provided. The frame has a forward vertically pivotal portion. This portion forward mounts the blade on a single pivot about a vertical axis. Removable locking pins permit fixing the blade and forward frame structure in desired relaxive position. Means are provided to remotely position the blade.

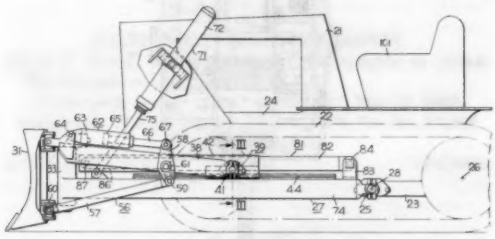
3,749,181
HYDRAULIC CONTROL SYSTEM FOR OPERATING THE BLADE OF A BULLDOZER
Hideo Jindai, Osaka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Feb. 29, 1972, Ser. No. 230,359
Int. Cl. E02f 3/76
U.S. Cl. 172—803 3 Claims

A hydraulic control system for operating the blade of a bulldozer which has a fluid pump, a fluid tank, a control valve for controlling the communication of the fluid fed from the fluid pump back to the fluid tank with three ports, a tilt-locking valve for communicating the fluid fed from the control valve with control cylinders and for shutting off the communication with the three ports, check valves for selectively passing only the fluid fed to the control cylinder side, throttle valves for passing the fluid at a constant rate of amount regardless of the



hydraulic pressure of the fluid from the control cylinder side to the fluid tank side, and a manual control lever mechanism for operating the control valve and the tilt-locking valve. Thus, the angle of the edge of the blade of the bulldozer may be accurately varied, and the tilting of the blade is also conducted with great ease.

3,749,182
ANGLE AND TILT MECHANISM FOR BULLDOZER
Harvey W. Rockwell, Springfield, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Apr. 7, 1972, Ser. No. 241,949
Int. Cl. B02f 3/76
U.S. Cl. 172—804 12 Claims



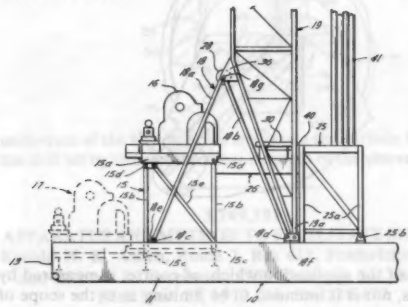
A bulldozer blade is mounted on the central front part of a C-frame so as to permit angling about a generally vertical axis by adjusting the position of the connecting points of braces and struts extending between the rear of the dozer blade and the legs of the C-frame. The dozer blade is tilted aboout a generally longitudinal axis by changing the length of extensible struts connected between the bottom rear of the dozer blade and the C-frame legs. The upper rear portion of the blade is interconnected to the C-frame by a link which serves to compensate for predetermined motion occuring between the dozer blade and the C-frame as dozer blade is tilted. A blade angling mechanism includes a pair of hydraulic jacks disposed telesopically within a pair of cylindrical members which are guided on longitudinal tracks on the legs of the C-frame to avoid side loading of the hydraulic jacks.

3,749,183

DEEP WELL DRILLING APPARATUS

Donald R. Branham; Paul E. Borg, and Douglas C. Goerner, all of Houston, Tex., assignors to Pyramid Derrick & Equipment Corp., Houston, Tex.

Filed Nov. 10, 1971, Ser. No. 197,431
Int. Cl. E21b *15/00*
U.S. Cl. 173—151 5 Claims



A base structure having front and rear ends is provided with an elevatable drawworks support, a gin pole structure, a mast mounted in front of the gin pole structure, and a pipe setback structure mounted in front of the mast on the base structure.

Movable means are secured between the base structure and drawworks support; sheave means are provided on the gin pole structure, and a flexible line is secured at one end to the mast and extends over the sheave means with its other end connected to the traveling block of the mast when the mast is in reclining position. The drawworks has a line connected over the sheave means on the gin pole structure and is connected to the crown block and traveling block of the mast so that the drawworks may elevate the mast to an upright position when the drawworks is on the base.

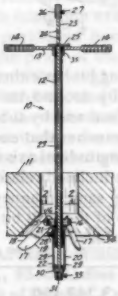
Thereafter, the pipe setback tower structure may be moved to an upright position on the base, and the drawworks elevated to an upright position above the base structure.

3,749,184

ICE HOLE FLARER

Edmund C. Andeen, 685 N. Fourth St., Warren, Minn.

Filed June 15, 1972, Ser. No. 263,245
Int. Cl. F25c *5/04*
U.S. Cl. 175—18 9 Claims



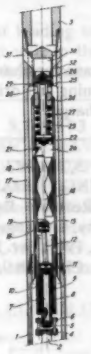
A tool for flaring the lower surface of an ice hole is provided wherein a first tubular member has a plurality of brackets spaced about a lower outer circumference thereof from which are pivotally suspended elongated blade members. A second tube member extends slidably over the lower end of said first tube with the upper portions of said second tubular member forming a camming surface for flaring said blade members outwardly from the first tubular member. The position of said second tubular member along the length of the first tubular member and accordingly the extent of flare of the blade members is determined by a shaft which extends through said first tubular member and is joined to said second tubular member.

3,749,185

DEVICE FOR REGULATING THE FEED FLOW OF A HYDRAULIC ROTARY MACHINE

Wladimir Tiraspolsky, 32 rue Horace Vernet, Issy-les-Moulineaux, and Roger Francois Rouviere, Venelles, both of France

Filed June 7, 1972, Ser. No. 260,666
Claims priority, application France, June 10, 1971, 7121050
Int. Cl. E21b *3/12*
U.S. Cl. 175—26 11 Claims



This device regulates the feed rate of flow to a hydraulic rotary machine such as a volumetric motor or drilling turbine in which a valve communicating with the circuit feeding the machine with fluid is controlled as a function of the rotary speed of said machine for by-passing a part of the fluid flow from the working elements of the machine. A pump is connected to the driving shaft of the machine in order to be driven therefrom and is connected to a source of fluid in order to force fluid into a chamber having an orifice communicating with the outside. A moving member subjected to the pressure prevailing in the chamber is connected to the valve in order to control its opening in the case of an excess of pressure within the chamber, so as to control the rate of flow. This arrangement makes it possible to stabilize the rotary speed of a machine such as a drilling motor or turbine.

3,749,186

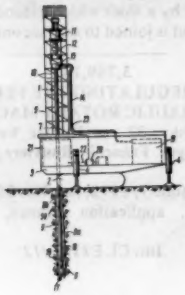
DRILLING STEM FOR DRILLING HOLES BLOWN-OUT BY PRESSURIZED AIR

Boris Nikolaevich Kutuzov, Sirenevy bulvar, 43, kv. 42; Igor Grigorievich Mikheev, ulitsa P. Romanova, 15/58, kv. 23; Vladimir Konstantinovich Grigoriev, Ljusinovskaya ulitsa, 53, kv. 53, all of Moscow; Viktor Dmitrievich Chugunov, ulitsa Shkolnaya 4, kv. 13, Moskovskaya oblast, Solnechnogorsky raion, poselok Povarovo; Isaak Emmanuilovich Narinsky, ulitsa Leningradskaya, 16, kv. 40, Khimki Moskovskoi oblasti; Alexandr Alexandrovich Trusov, Konkovo-Derevlevo, Mikroraion 1, korpus 4, kv. 96; Georgy Ivanovich Sharonov, Samarkandsky bulvar, 34, korpus 3, kv. 66, both of Moscow, and Viktor Fedorovich Golosov, sanatory imeni Artema, 2, kv. 43, Firsanovka Moskovskoi oblasti, all of U.S.S.R.

Filed July 3, 1972, Ser. No. 268,889
Int. Cl. E21b *21/00*; E21c *7/08*
U.S. Cl. 175—228 6 Claims

A drilling stem which has a passage for drilling fluid, that is separated from a passage for pressurized air, and a chamber or

tank for lubricant grease undergoing the pressure of the drilling fluid delivered from said separated passage, said tank being disposed above the drilling cutter bit. The drilling stem



is also provided with means for charging the tank with lubricant grease and for draining the drilling fluid from the tank while the latter is being charged.

3,749,187

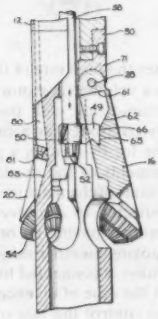
UNDERREAMER HAVING VARIABLE ARM EXTENSION

Clarence H. Leathers, Redondo Beach, Calif., assignor to Grant Oil Tool Company, Los Angeles, Calif.

Filed May 8, 1972, Ser. No. 251,393

Int. Cl. E21b 9/26

U.S. Cl. 175—269 **3 Claims**



An underreamer for enlarging a well bore wherein a plurality of cutter cones are rotatably supported on pivoted cutter arms which pivot outwardly from the body of the tool in response to fluid pressure. The amount of outward pivotal movement is adjustable without the removal and replacement of the cutter arms. This permits the same tool body and pivotable arms to be used for bore enlargements to different diameters relative to the contracted diameter of the tool.

3,749,188

DRILL BIT

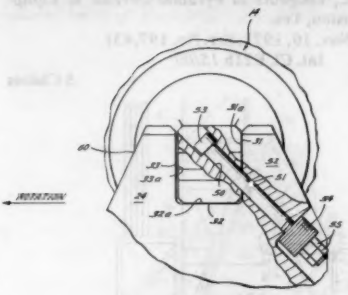
Percy W. Schumacher, Jr., Houston, Tex., assignor to G. W. Murphy Industries, Inc., Houston, Tex.

Filed Aug. 20, 1971, Ser. No. 173,451

Int. Cl. E21b 9/08

U.S. Cl. 175—364 **6 Claims**

A drill bit including at least one roller cutter rotatably mounted on a shaft which is supported between two legs of a saddle wherein the ends of the shaft are non-circular in cross section and fit with non-circular portions on the legs, the shaft being secured to the legs by bolt means passing diagonally through the shaft ends and one side of the mating saddle leg, whereby the shaft may be held against turning with respect to the saddle legs. This abstract is neither intended to define the



invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,749,189

ROCK DRILLING BIT

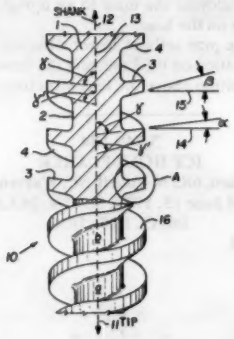
Otto Boehm, Starnberg, Germany, assignor to Werkzeugbau GmbH, Starnberg, Germany

Filed Mar. 1, 1971, Ser. No. 119,782

Claims priority, application Germany, Dec. 2, 1970, P 20 59 232.9

Int. Cl. E21c 13/04

U.S. Cl. 175—394 **5 Claims**



The present rock drilling bit has either one or two worms or screws extending helically around its shaft. Each worm is formed by a bottom surface and by substantially laterally extending flanks in such a manner that each bottom surface extends in parallel to the longitudinal axis of the shaft of the drill bit. The lateral flanks are inclined relative to said bottom surface substantially in the same manner, whereby the flank which is closer to the tip of the drill bit forms an acute angle relative to said bottom surface.

3,749,190

RETAINING CARBIDE IN ROCK DRILL BITS

Clarence S. Shipman, Easton, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.

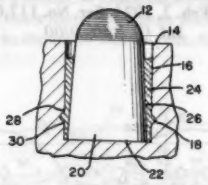
Filed May 6, 1971, Ser. No. 140,793

Int. Cl. E21c 13/02, 13/06

U.S. Cl. 175—410 **2 Claims**

A rock drill bit having tapered carbide buttons projecting

from its working face is described in which the buttons are retained in the bit by means of sleeves which are extruded into



undercuts of the button holes and retain the carbide buttons in the drill bit by vitue of the shear strength of the sleeves

---

3,749,191

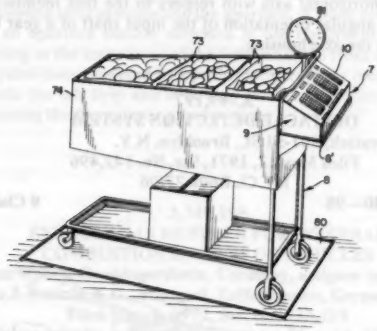
APPARATUS AND METHOD TO FACILITATE SHOPPING

Ronald H. K. Ashen, Route 2, Box 611, Fredericksburg, Va. and Richard L. Carpenter, 4709 Ramsgate Ln., Bowie, Md.

Filed Mar. 23, 1972, Ser. No. 237,477

Int. Cl. G01g *19/00, 19/52*

U.S. Cl. 177—1 **4 Claims**



A recorder for use by shoppers in a self-service store, having three sets of key banks for recording three groups of symbols, such as numerals, appearing on each item selected for purchase by the buyer. The recorder includes a mechanical verifier for determining the accuracy of the entries made in the recorder. The indicia appearing on each purchased item includes a coded number which, combined with the other two numbers of the indicia, must equal a predetermined total for the information to be recorded in the machine, and for restoring the keyboard to a condition ready to accept indicia appearing on the next purchased item. One of the other two numbers represents the price of the selected item while the other number represents the weight in ounces. When the indicia from all of the items selected for purchase are properly entered and totaled in the recorder, if the total weight of the selected items is correct, then the total price will be correct and may be paid by the customer without further checking or tallying of the purchases.

3,749,192

COLLAPSIBLE WHEEL CHAIR

Andrew Karchak, Jr., 9530 Ardine St., and James R. Allen, 10418 Chaney, both of Downey, Calif.

Filed July 16, 1971, Ser. No. 163,388

Int. Cl. A61g *5/04;* **B62d** *11/04*

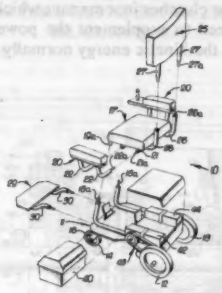
U.S. Cl. 180—6.5 **7 Claims**

A collapsible wheel chair comprises:

a. a base carrying wheel means,

b. a seat unit, and

c. there being tubular shaft means carried by the base and seat unit to provide a resiliently yieldable support for the seat, and having releasable telescopic interconnection



characterized in that loading transmitted via said shaft means from the seat unit to the base frictionally interlocks said telescopic interconnection.

3,749,193

LOAD LIFTING VEHICLE HAVING A LATERALLY ADJUSTABLE GROUND SUPPORTED ELEMENT

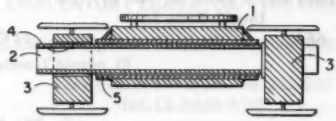
Helmut Blase, Dortmund-Derne, and Richard Gorl, Dortmund, both of Germany, assignors to Rheinstahl Aktiengesellschaft, Essen, am Rheinstahlhaus, Germany

Filed Aug. 6, 1971, Ser. No. 169,693

Claims priority, application Germany, Sept. 26, 1970, P 20 47 480.0

Int. Cl. B62d *55/00*

U.S. Cl. 180—9.48 **4 Claims**



A load lifting vehicle particularly an endless track crane comprises a support chassis which is centrally arranged between a travelling gear frame on each side thereof. The travelling gear frames are supported by respective support beams on each side of the chassis which are telescopic within the central chassis and which are connected to the respective gear frames. Two support beams may be provided on each side of the chassis which are arranged either so that they are offset from the beams on the other side or they are in alignment with the beams on the other side and telescoped within the chassis up to an intermediate central point. To provide for maximum contraction and lateral extension of the travelling gear frames for varying the wheel base or track bases, the travelling gear frames are advantageously provided with through openings so that the supporting beam for the travelling gear frame on the opposite side may be telescoped completely through the central changes and through an opening of the gear frames to project beyond the opposite side of the gear frames if desired during contraction of the base.

3,749,194

INERTIAL ENERGY SYSTEM FOR VEHICLES

John Bardwick, III, 1733 Westridge, Ann Arbor, Mich.

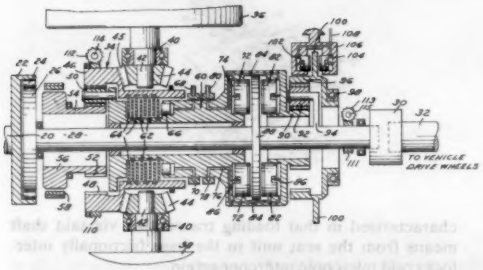
Filed Mar. 19, 1971, Ser. No. 126,156

Int. Cl. B60k *11/10*

U.S. Cl. 180—54 R **12 Claims**

An inertial flywheel system for vehicles including an automatic transmission which has clutch means for introducing energy to the flywheel from an engine or from a coasting or

decelerating vehicle, and clutch means for transferring the stored energy to the vehicle on demand. A system of control is incorporated in the brake pedal and accelerator. The control system operates the clutches in a manner which allows stored energy to be utilized to supplement the power plant of the vehicle and allows the kinetic energy normally lost in braking



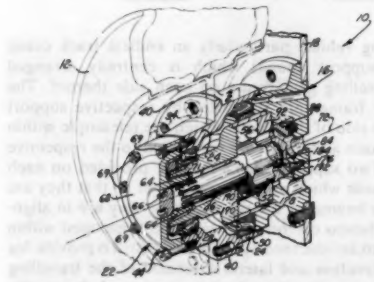
to be transferred instead to the flywheel. The control system and transmission function together to insure efficient energy transfer, regulate the relation between flywheel speed and vehicle speed, modify performance of the system in response to grades, and transfer the braking function to the normal vehicle brake system when required.

3,749,195

HYDROSTATIC DRIVE TRANSMISSION ASSEMBLY

Edgar Z. Vegners, Mound, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 3, 1971, Ser. No. 139,700
Int. Cl. B60k *7/00*
U.S. Cl. 180—66 F **12 Claims**



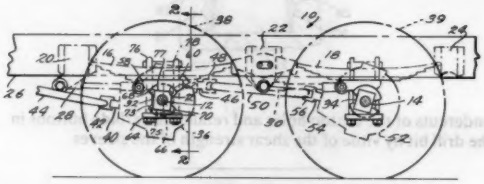
An improved hydrostatic transmission drive assembly for driving a wheel of a vehicle includes a fluid motor having a housing which defines a work chamber enclosing a rotor which drives an output member. A drive means transmits torque from the output member to the wheel of the vehicle and supports the output member for rotational movement about the central axis of the housing. This drive means includes a tubular drive element which circumscribes the housing and is rotatably supported on the housing by a pair of bearing assemblies so that radial loads on the wheel are transmitted to the relatively strong housing by the tubular drive element and bearing assemblies. The tubular drive element is connected with the output member by an end wall and a tubular inner wall which extends into the housing and engages one end of the output member.

3,749,196

AXLE ATTACHMENT DEVICE

Charles O. Traylor, Springfield, Mo., assignor to Hutchens & Sons Metal Products, Springfield, Mo.

Filed Feb. 2, 1971, Ser. No. 112,009
Int. Cl. B60g *9/00*
U.S. Cl. 180—85 **3 Claims**



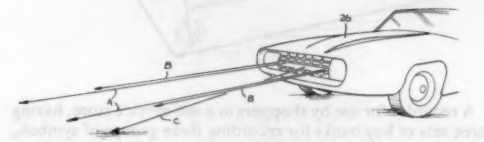
An axle housing mounting structure is provided having one member adapted to be attached to the vehicle frame and another member adapted to be securely attached to the exterior surface of the axle housing; the two members are provided with complementary slidably interfitting surfaces so that the axle housing engaging member may be rotated about a generally horizontal axis with respect to the first member to adjust the angular orientation of the input shaft of a gear box located on the axle housing.

3,749,197

OBSTACLE DETECTION SYSTEM

Benzion Deutsch, 901-51 St., Brooklyn, N.Y.

Filed May 12, 1971, Ser. No. 142,496
Int. Cl. B60k *27/06*
U.S. Cl. 180—98 **9 Claims**



A vehicle capable of motion, such as a car or a motor boat is provided with beams extending in front of the vehicle. The beams may be ultrasonic beams, radar or laser beams. Devices producing the beams and located within the vehicle have several automatically produced functions, namely, they can cause the beams to be raised or lowered, they can vary their effective lengths depending upon the speed of the vehicle and they can cause the vehicle to stop or to reduce its speed when an object located in front of the vehicle is sensed. The beams are also arranged to provide automatic adjustment to all changes in the angle between the road surface and the horizontal.

3,749,198

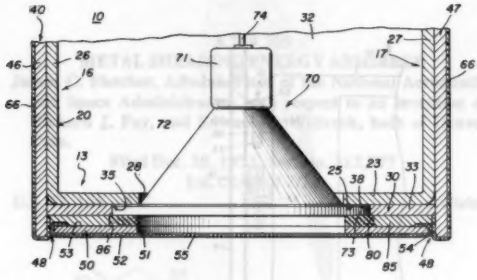
SOUND REPRODUCTION SYSTEM

Scott F. Everitt; Robert E. Croup, and Alvin A. Strawn, all of Indianapolis, Ind., assignors to Acoustic Fiber Sound Systems, Inc, Indianapolis, Ind.

Filed June 8, 1972, Ser. No. 261,016
Int. Cl. G10k *13/00*; **H04r** *1/28*
U.S. Cl. 181—31 B **14 Claims**

A sound reproduction system includes a loudspeaker enclosure having a plurality of walls of corrugated material interconnected to form a closed housing, each wall having two layers of corrugations with corrugations of each layer extending perpendicular to the corrugations of adjacent layers, one

wall having aligned openings respectively in the two layers of corrugations thereof, the opening in the outer layer being larger than the opening in the inner layer and cooperating therewith to form a recess. A loudspeaker is received through the openings and has a mounting flange accommodated in the recess and glued to the front wall thereat, the front surface of



the loudspeaker having glued to it an angular sealing and cushioning strip surrounding the aperture. A front cover panel has an aperture therein disposed in use congruent with the opening in the inner layer of the front wall, the front surface of the panel being covered by a grille cloth; a spacer member surrounds the felt strip and is in turn glued to the front wall for mounting the front cover panel in place.

3,749,199

EXHAUST GAS MUFFLER FOR INTERNAL COMBUSTION ENGINES OF VEHICLES

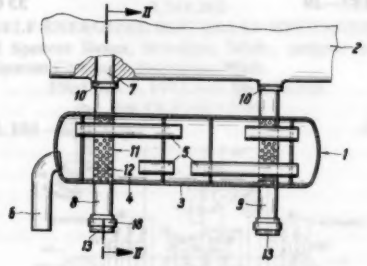
Julius Weber, Grossingersheim, Germany, assignor to Dr.-Ing. h.c.f. Porsche K.G., Stuttgart, Zuffenhausen, Germany

Filed Mar. 9, 1972, Ser. No. 233,219

Claims priority, application Germany, Mar. 12, 1971, P 21 11 865.0

Int. Cl. F01m 7/00

U.S. Cl. 181—38 **8 Claims**



An exhaust gas muffler for internal combustion engines of vehicles, especially for internal combustion engines of sports vehicles, which participate both in traffic on public roads as also in closed sporting events; the exhaust gas muffler which is provided with silencing means is constructed as combination muffler having several exhaust pipes, in which the conduction of the exhaust gases from the internal combustion engine to the exhaust pipes takes place selectively by way of the silencing means of the muffler or in by-passing relationship to the silencing means into the atmosphere.

3,749,200

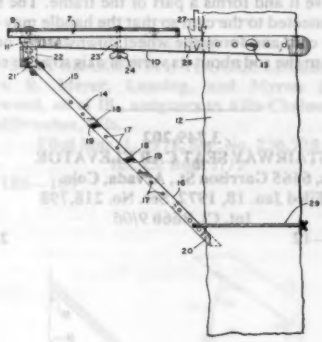
PORTABLE STAND ADAPTED FOR TREE MOUNTING

Leonard S. Meyer, 6449 Bridgewood Rd., Columbia, S.C.

Filed Feb. 24, 1972, Ser. No. 229,116

Int. Cl. A47g 9/10

U.S. Cl. 182—187 **3 Claims**



A portable stand is disclosed particularly adapted for use by hunters and naturalists, the stand being removably mountable upon trees and having spaced beams which are adjustable to embrace trees of different sizes. The stand is further provided with spaced supporting legs which are adjustable in both length and angular disposition in order to adapt the stand to the trunk or branches of trees of various shapes. The stand is arranged for convenient erection and collapse, so that it may readily be transported from place to place.

3,749,201

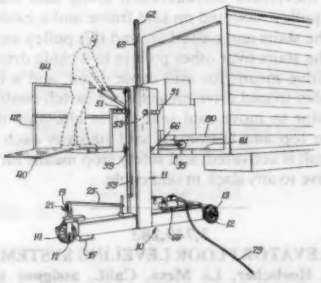
AMBULATORY ELEVATOR WITH FOLDING PLATFORM

Jesse E. Clarke, Highland Park, Ill., assignor to Autoquip Corporation, Chicago, Ill.

Filed Feb. 2, 1972, Ser. No. 222,846

Int. Cl. B66b 9/20

U.S. Cl. 187—9 **10 Claims**



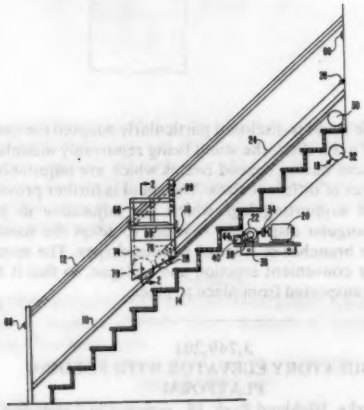
A portable lift has a frame with a vertical mast. The mast defines two ways, one of which is closed on the front and back side while the other is closed only on the back side. A platform has upper wheels in the first ways and lower wheels in the second ways so that the platform is pivotal about the axis of the upper wheels, with the lower wheels moving away from the mast during pivoting. When horizontal the platform is too large to go through a doorway, but when pivoted, the frame and platform will go through a doorway. Within the mast is a hydraulic cylinder, the piston of which extends downwardly and is attached at its lower end to the frame. The cylinder is attached to the platform at a pivotal axis coincident with the axis of the upper wheels. Cables are provided to connect between the top of the mast and the middle of the platform

when the platform is in the raised position so that when the hydraulic cylinder is lowered from the raised position, the cables will pull the platform into the hold position. The frame is mounted on wheels, one of which is dirigible. The dirigible wheel is attached to a vertical rod which has a cam eccentrically connected thereto. The cam bears against an abutment which is above it and forms a part of the frame. The steering handle is connected to the cam so that the handle may be used to rotate the cam and force the wheel downwardly, or it may be used to turn the rod about its vertical axis so as to steer the wheel.

3,749,202
STAIRWAY SEAT CAR ELEVATOR

Louis G. Puls, 6665 Garrison St., Arvada, Colo.

Filed Jan. 18, 1972, Ser. No. 218,798
Int. Cl. B66b *9/06*
U.S. Cl. 187—12 **2 Claims**



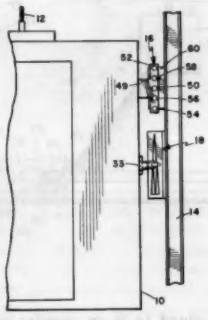
The stairway seat elevator is composed of a pair of guide rails mounted on the side of a staircase in vertically spaced parallel relation, a seat car frame extending between said rails for guided movement therebetween along said stairway by means of a pulley mounted on said frame and a cable fixed at the top of the stairs and passed around this pulley and back to the top of the stairs over other pulleys to a cable drum, a non-reversible drive means for said cable drum, and a reversible motor coupled to said drive means, limit switch control means for said motor to move said seat car in alternate directions between the top and bottom of said stairway each time the control circuit is activated, and safety stop means for said seat car responsive to any slack in said cable.

3,749,203
ELEVATOR FLOOR LEVELING SYSTEM

William R. Hoelscher, La Mesa, Calif., assignor to United States Elevator Corporation, Spring Valley, Calif.

Filed Aug. 11, 1971, Ser. No. 170,841
Int. Cl. B66b *1/40*
U.S. Cl. 187—29 R **9 Claims**

A system for landing and leveling elevators or otherwise controlling the spacial relationship between two relatively movable objects. The system incorporates a pair of vanes that include a light transmitting opening along their long dimension. A light bulb movable with the elevator car traverses the space between the two light vanes and a pair of light sensors view the light bulb through the openings in the vanes. The vane openings are tapered from a relatively large to a relatively narrow end and this taper is in opposite directions on opposite ones of the pair of vanes. The relative displacement position between the light vane and the sensor-bulb position, that produces an equal signal on each sensor, comprises a null, and this null position is set to correspond to the desired location for the car. The null is developed by comparing the signals in a differential amplifier, any deviation from the null position will produce an amplified error signal that may be used to input an electronic elevator drive control means or other means for controlling relative motion. Also incor-

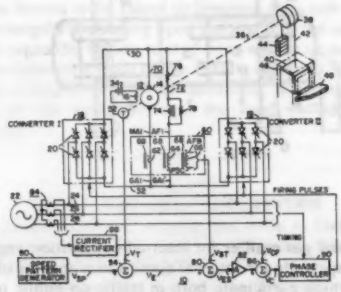


porated in the system is an error modifying means for increasing the error signal when there is a relative acceleration between the parts of the system. The signal is also increased and at an increasing rate with the persistence of an error for a period of time. Thus, the system closely follows the movement of the elevator with respect to the hoistway and maintains its position accurately at the desired floor level through inputs to the elevator drive means.

3,749,204
ELEVATOR SYSTEM

William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1972, Ser. No. 256,318
Int. Cl. B66b *1/28*
U.S. Cl. 187—29 **33 Claims**



An elevator system including a structure having a plurality of landings, an elevator car, a drive motor for moving the car relative to the structure to serve the landings, and control apparatus for controlling the drive motor. The control apparatus includes an acceleration transducer which provides a substan-

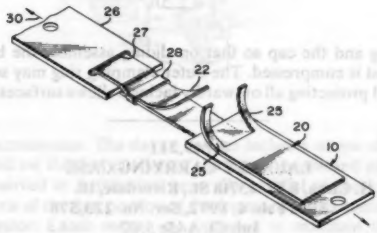
tially ripple-free stabilizing signal responsive to acceleration by detecting the rate of change of the counter emf of the drive motor. The circuit in which the stabilizing signal is developed is devoid of metallic connection to the drive motor circuit, permitting its use with a solid state source of direct current potential, as well as with a rotating source.

3,749,205

METAL SHEARING ENERGY ABSORBER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Richard J. Fay, and Edward P. Wittrock, both of Denver, Colo.

Filed Dec. 28, 1971, Ser. No. 212,977
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C **3 Claims**



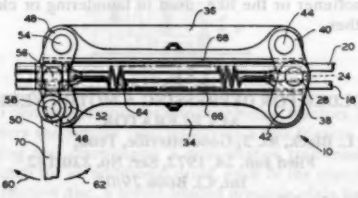
A metal shearing energy absorber is disclosed comprising a flat thin strip of metal which is pulled through a slot in a cutter member of a metal, harder than the metal of the strip. The slot's length, in the direction perpendicular to the pull direction, is less than the strip's width so that as the strip is pulled through the slot, its edges are sheared off, thereby absorbing some of the pulling energy. In one embodiment the cutter member is a flat plate of steel, while in another embodiment the cutter member is U-shaped, with the slot at its base.

3,749,206

SELF-ENERGIZED DISC BRAKE MECHANISM

Donald Spencer Dence, Brooklyn, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 9, 1971, Ser. No. 206,315
Int. Cl. F16d 55/46
U.S. Cl. 188—72.2 **3 Claims**



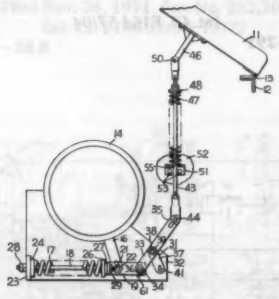
A brake mechanism which is self-energizing and adapted to brake a rotatable disc is disclosed. The mechanism includes a pair of pressure members which may be moved toward one another into frictional engagement with the rotatable disc disposed therebetween and a linkage connecting the pressure members with a stationary frame. The linkage requires that a component of the braking force exerted by the pressure members in braking the rotation of the disc be utilized to urge the pressure members toward the disc and into greater frictional engagement with the disc.

3,749,207

SEAT BRAKE WITH TOGGLE LINKAGE

Theodore R. Meyer, Lansing, and Myron J. Boyajian, Homewood, all of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 1, 1972, Ser. No. 230,778
Int. Cl. B60t 7/12
U.S. Cl. 188—109 **7 Claims**



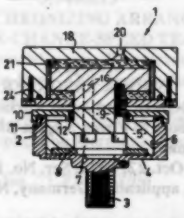
The operating linkage of a dead-man seat brake includes a toggle with an in-line or centered position in the brake released position of the linkage wherein the force exerted by the rather large brake applying spring is isolated from the operator's seat. A relatively weak spring biases the seat upwardly to break the in-line position of the toggle when the operator vacates the seat.

3,749,208

A MOUNTING ASSEMBLY

Eric Miller, and Robert Eric Miller, both of New South Wales, Australia, assignors to R. E. Miller Pty. Limited, New South Wales, Australia

Filed Dec. 6, 1971, Ser. No. 204,898
Claims priority, application Australia, May 18, 1971, 4915/71
Int. Cl. F16d 63/00
U.S. Cl. 188—271 **8 Claims**



A mounting assembly for an instrument or a machine to be panned, comprising two piston and housing assemblies, one

assembly incorporating viscous drag and the other being for free panning.

3,749,209

HYDRODYNAMIC BRAKING SYSTEM FOR APPLYING AN IMPACT-FREE BRAKING TORQUE TO A ROTATING MEMBER

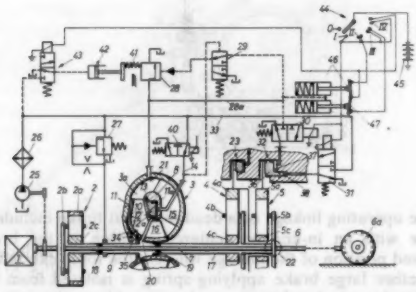
Hellmut Weinrich, Zang; Johannes Peltner, Steinheim; Friedrich Helfer, Zang; Heinrich Dick, and Fritz Haeberle, both of Heidenheim, all of Germany, assignors to Voith Getriebe KG, Heidenheim (Brenz), Germany

Filed Apr. 30, 1971, Ser. No. 139,047

Claims priority, application Germany, May 2, 1970, P 20 21 543.4

Int. Cl. F16d *57/04*

U.S. Cl. 188—291 **14 Claims**



In a hydrodynamic machine, to effect a rapid, yet impact-free braking of a rotating shaft, there is provided a braking system which includes a coupling means to connect the brake rotor of the hydrodynamic machine to said shaft. The coupling means includes a stepped brake piston having a small work face and a hydraulically separate large work face. In the first phase of the braking operation, the piston is rapidly actuated by exerting on said small work face a pressure generated by a continuously operated auxiliary pump. In the second phase of the braking operation, the said large work face of the stepped piston is exposed to a pressure which corresponds to the momentary outlet pressure of the hydrodynamic machine and which may be set by an arbitrarily controllable device forming part of said braking system.

3,749,210

SHOCK ABSORBER

Johannes Jasper DeBaan, and Adolf Adrian, both of Ennepetal, Germany, assignors to Firma August Bilstein, Ennepetal-Altenvoerde, Germany

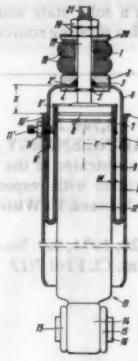
Filed Oct. 22, 1971, Ser. No. 191,872

Claims priority, application Germany, Nov. 2, 1970, P 20 53 826.5

Int. Cl. B60g *11/26*

U.S. Cl. 188—298 **8 Claims**

A rolling bellows of a shock absorber incorporating a damper unit is sealingly secured between a housing of the damper unit and a concentric cap encircling a piston rod extending from the damper unit. Sealing attachment is effected by two clamping rings which are dimensioned relative to the



housing and the cap so that on sliding assembly the bellows material is compressed. The outer clamping ring may serve as a shield protecting all outwardly facing bellows surfaces.

3,749,211

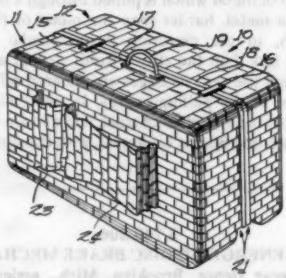
LAUNDRY-CARRYING CASE

Robert H. Cima, 8 W. 137th St., Riverdale, Ill.

Filed Feb. 4, 1972, Ser. No. 223,578

Int. Cl. A45c *5/02*

U.S. Cl. 190—49 **3 Claims**



A novel laundry-carrying case for carrying clothes to and from a LAUNDROMAT or laundry room, where laundry is brought to be washed and dried or cleaned, the carrying case comprising hinged sections formed of plastic coated webbing with the hinged sections latched or locked together and provided with a handle, at least one of the sections having pockets or compartments for receiving soap or detergent, bleach, fabric softener or the like, used in laundering or cleaning of the clothes.

3,749,212

HOLDER FOR DEPRESSING A MOTOR VEHICLE ACCELERATOR

Donald L. Black, Rt. 3, Goodlettsville, Tenn.

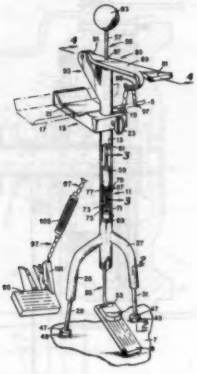
Filed Jan. 24, 1972, Ser. No. 220,132

Int. Cl. B60k *29/02*

U.S. Cl. 192—3 T **6 Claims**

Apparatus for depressing the accelerator of a motor vehicle and including frame means having a first portion adapted to extend downwardly from the dashboard of a vehicle and terminate at a point above the accelerator and a second portion laterally offset from the first portion and extending toward the

floorboard of the vehicle. This second portion of the frame includes leg means spring biased in an extended position and adapted to contact the floorboard to urge the frame toward the dashboard and maintain the longitudinal axis of the frame oriented generally along a line extending from the dashboard



to the accelerator. The device further includes means slidably mounted on the first portion of the frame means and adapted to be moved in a direction generally parallel to the longitudinal axis of the first portion of the frame means to contact the accelerator. Latch means are included to maintain the accelerator contact means in contact with the accelerator.

3,749,213

FRICTION CLUTCH ASSEMBLY

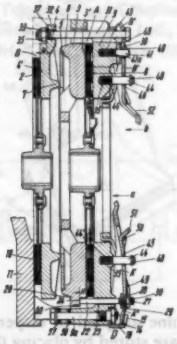
Paul Maucher, Sasbach, Germany, assignor to Luk Lamellen und Kupplungsbau Gmb H, Buhl/Baden, Germany

Filed Sept. 20, 1971, Ser. No. 181,690

Claims priority, application Luxembourg, Sept. 18, 1970, 61710

Int. Cl. F16d *13/40, 21/02*

U.S. Cl. 192—48.8 **50 Claims**



Friction clutch assembly for motor vehicles, tractors, equipment carriers and similar vehicles having a first friction clutch for engaging and disengaging a gear-change transmission, a second clutch for an additional drive, each of the clutches including a friction disc, a spring-loaded pressure plate having a friction surface and being coordinated with each of said friction discs, respectively, an axially fixed structural unit for connecting the second clutch to a flywheel, torque or transmitting means located in a power transmission path between the flywheel or the axially fixed structural unit, on the one hand, and the pressure plates, on the other hand, and a disengaging lever system for each of the clutches, the disengaging lever systems having a respective disengaging means, the pressure plate of the first friction clutch and the pressure plate of the second clutch being mutually exchangeable in another assembled condition of the friction clutch assembly, the pressure plates respectively having receiving and engagement means for receiving the disengaging means of either of the clutches in which the respective pressure plates are then assembled, and engageable by the torque transmitting means in whichever clutch the pressure plates are assembled.

3,749,214

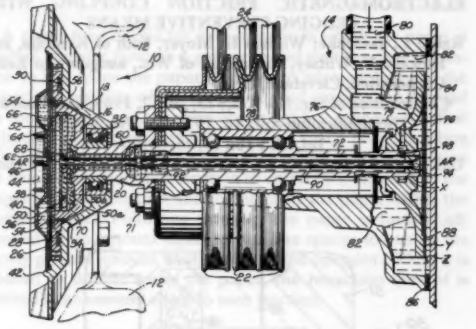
VISCOUS COUPLING HAVING AN IMPROVED COOLANT SYSTEM

Wayne K. Leichliter, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 26, 1971, Ser. No. 202,209

Int. Cl. F16d *35/00, 13/72*

U.S. Cl. 192—58 B **7 Claims**



A viscous coupling apparatus includes relatively rotatable input and output members configured so as to define a shear space therebetween so that the viscous fluid in the shear space transmits torque between the members. The transmission of torque results in the generation of heat. One of the members has a chamber for receiving a coolant medium for dissipating at least a portion of the generated heat. Means are provided for effecting substantially continuous flow of the coolant medium into and out of the chamber during transmission of torque and this means includes an inlet conduit for directing the coolant medium into the chamber and a separate outlet conduit for directing heated coolant medium from the chamber.

3,749,215

BLOCKING SYNCHRONIZING ARRANGEMENT FOR MOTOR VEHICLE-CHANGE-SPEED TRANSMISSIONS

Gunter Worner Rommelshausen, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 15, 1971, Ser. No. 208,375

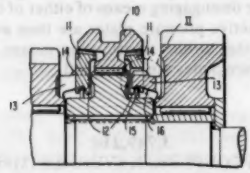
Claims priority, application Germany, Dec. 15, 1970, P 20 61 619.7

Int Cl F16d *23/06*

U.S. Cl. 192—53 F **6 Claims**

A blocking synchronization for motor vehicle change-speed transmissions in which an axially displaceable shifting sleeve cooperates with synchronizing rings that are also axially displaceable and rotatable within limits; the synchronizing rings, in their turn, cooperate by means of blocking surfaces with en-

gaging teeth at the gear, whereby an annular spring guided in the synchronizing ring for producing at the synchronizing ring a force directed toward the shifting sleeve, cooperates with a



cone surface at the gear, which cone surface has a considerably steeper inclination in its portion directed toward the shifting sleeve.

3,749,216

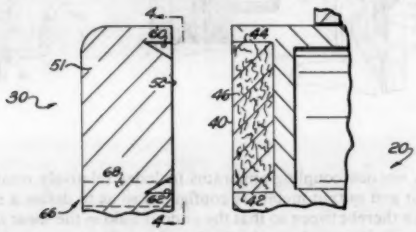
ELECTROMAGNETIC FRICTION COUPLING WITH LEDGING PREVENTIVE MEANS

Ralph L. Jaeschke; William H. Moyer, both of Kenosha, and Howard E. Wiltsey, Racine, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 838,523, July 2, 1969, abandoned. This application Apr. 16, 1971, Ser. No. 134,910

Int. Cl. F16d *13/46, 69/00*

U.S. Cl. 192—70.14 **9 Claims**



A coupling transmits torque between driving and driven members. Each of these members has a torque transmitting surface which, when in an engaged position, establishes a driving relationship between the members and when in a disengaged position, allows relative rotation between the members. When the members are in a driving relationship, their respective surfaces generate wear contaminants when transmitting torque therebetween. One of the members has means for directing the wear contaminants from the torque transmitting surfaces. In addition, one of the members has at least one annular groove therein operable to substantially eliminate wear projections from being created on the one member.

3,749,217

FLUID CLUTCH WITH SELF-CONTAINED PUMP

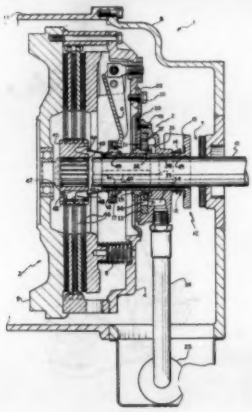
Carl D. Bush, Solvay, and Robert S. Root, Syracuse, both of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,121

Int. Cl. F16d *13/72*

U.S. Cl. 192—113 B **4 Claims**

A fluid clutch having a fluid pump contained within the clutch assembly. The pump is fixed against axial or rotational movement and is disposed in the assembly in concentric relation to the output shaft. The pump is driven by a direct connection from the clutch input means and operates whether the clutch friction members are engaged or not. The pump encircles a pull mechanism sleeve that is interposed between it and



the output shaft, the sleeve being movable axially entirely independently of the pump to disengage the clutch friction members.

3,749,218

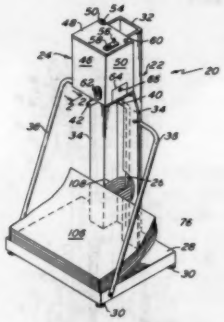
BAG VENDING MACHINE

Henry Verbeke, Chester, N.J., assignor to APL Corporation, Great Neck, N.Y.

Filed Nov. 9, 1971, Ser. No. 196,968

Int. Cl. G07f *11/00*

U.S. Cl. 194—2 **5 Claims**



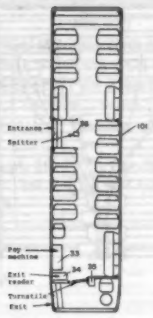
A vending machine adapted to dispense bags having bail handles. The bags are stored by placing the bails over a vertically extending shaft, and by providing a metering plate at the top of the shaft whereby only one bag can be dispensed at a time. The metering plate is coin controlled, and a bag can be dispensed only after a predetermined amount of money has been inserted in the device. The improvement of this invention resides in the provision of a mechanism to insure that a bag will be dispensed each time the predetermined amount of money has been inserted in the machine. In the prior devices, it is possible to insert the predetermined amount of money, have the machine collect the money and be automatically reset, while at the same time the bag will not be dispensed.

3,749,219

AUTOMATIC ZONE-FARE TICKETING FOR PUBLIC TRANSPORTATION VEHICLES

David G. Wilson, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 17, 1971, Ser. No. 209,130
Int. Cl. G07b 15/02
U.S. Cl. 194—4 R 6 Claims



Apparatus is disclosed to allow passengers using public transportation vehicles such as, buses, rail cars and the like to receive a ticket upon boarding a vehicle and to make payment while on board, the amount of payment being partly dependent upon the length of the trip. The ticket, which is obtained from a ticket spitter, is validated for the particular-length trip by a pay machine operated by the passenger while traveling toward the destination, and proper validation is verified by an exit reader upon disembarking from the vehicle. The whole business transaction is handled automatically without need of any participation on the part of the vehicle driver.

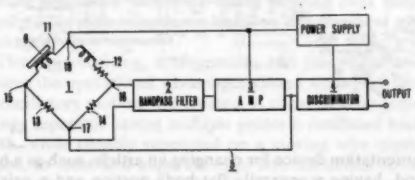
The invention herein described was made, in part, in the course of a contract with the United States Department of Transportation.

3,749,220

COIN DISCRIMINATING APPARATUS

Yukio Tabiichi; Yuichi Yamazaki, both of Tokyo; Takao Saito, Kawasaki, and Toshimitsu Kataoka, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Anritsu Electric Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1971, Ser. No. 186,964
Int. Cl. G07f 3/02
U.S. Cl. 194—100 A 13 Claims



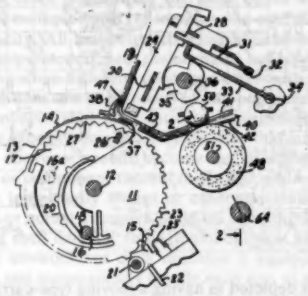
The coin discriminating apparatus comprising a bridge circuit including an electromagnetic detection coil, a reference element, a bandpass filter connected to the output of the bridge circuit, an amplifier responsive to the output of the bandpass filter and a feedback circuit for positively feeding back the output of the amplifier to the bridge circuit. The reference element includes a reference metal piece which compensates for the variation of the characteristic of the electromagnetic detector coil caused by the variation in the ambient temperature.

3,749,221

PAPER FEED MECHANISM FOR DATA PRINTERS

Richard E. Busch, Hacienda Heights, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Feb. 24, 1972, Ser. No. 229,035
Int. Cl. B41j 21/00
U.S. Cl. 197—116 10 Claims



A paper feed device for data printers in which the paper is pushed endwise through a guide channel past the printing station to line space the paper. In order to adequately space the paper to a position where the last printed amount can be read by the operator and to insure consistent line spacing, it is first retracted an amount equal to one line space plus a fraction thereof and is then pushed endwise in an advancing direction an amount equal to such fraction to correct for backlash in the paper drive mechanism and to compress the paper within the guide channel. Following printing, the paper is further advanced by an amount equal to two line spaces to enable the newly printed amount to be visible to the operator. When it is desired to double space the paper, the retraction thereof is limited to an amount equal to such fraction.

3,749,222

IMPRESSION FABRIC MADE OF YARN CONTAINING VARIABLE SHRINKAGE FILAMENTS

Jack Leach, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 16, 1971, Ser. No. 115,761
Int. Cl. B41j 31/02
U.S. Cl. 197—172 5 Claims

Woven impression fabric for use in a printing machine and having improved ink retention and ink metering characteristics, said fabric being woven with filling yarns of composite synthetic continuous filament yarns in which at least two sets of filaments possess differential shrinkage characteristics, said yarns being uniformly textured along their length due to the shrinkage of at least one of the sets of filaments.

3,749,223

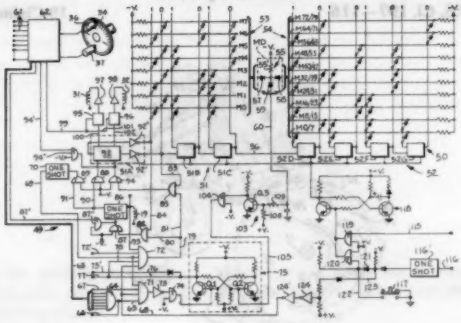
ELECTRONIC TABULATION CONTROL SYSTEM FOR RECORDER

John Guzak, Jr., Waukegan, Ill., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 22, 1968, Ser. No. 722,919
Int. Cl. B41j 25/18
U.S. Cl. 197—176 17 Claims

There is disclosed a control system for a recorder such as a printer by which tabulation or columnization of data on a record medium is effected electronically, without the use of mechanical tab stops. In one specific embodiment, a carriage which mounts a pair of print hammers is controlled by electronic circuitry to effect tabulation. When a tabulating signal is received printing is inhibited and the carriage is advanced stepwise until the carriage arrives at the next preselected

recording position. At that preselected recording position, stepping of the carriage ceases and printing is no longer inhibited. In another specific embodiment, the carriage mounts a single print hammer. In yet another specific embodiment,



the recorder is depicted as having a moving type-carrier and a bank of print hammers; tabulation is automatically effected upon receipt of a tabulating signal so that printing is enabled at the next preselected recording position.

3,749,224

HANDRAIL DRIVE ARRANGEMENT FOR ESCALATORS AND HUMAN CONVEYOR BANDS

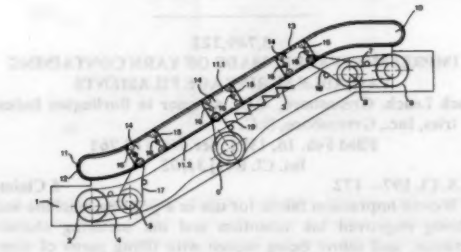
Karl Engeler, Schlieren, Switzerland, assignor to Inventio Aktiengesellschaft, Hergiswil N.W., Switzerland

Filed Feb. 14, 1972, Ser. No. 226,120

Claims priority, application Switzerland, Feb. 24, 1971, 2699/71

Int. Cl. B66b 9/12

U.S. Cl. 198—16 **4 Claims**



A handrail drive arrangement for personnel transport means, especially escalators and human conveyor bands or belts wherein power transmission is carried out by means of an entrainment mechanism which engages with a toothed arrangement located at the underside of a flexible handrail. According to the invention the entrainment mechanism positively couples the advancing run and the return run of the handrail with one another and simultaneously transmits the driving force or motive power to the advancing run and the return run.

3,749,225

CHANNELIZER APPARATUS

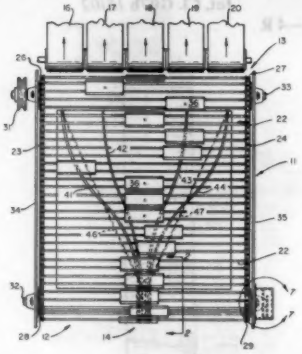
William S. Kennedy, San Jose, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Nov. 11, 1971, Ser. No. 197,657

Int. Cl. B65g 47/26

U.S. Cl. 198—31 AA **9 Claims**

Channelizer apparatus for channeling products to various positions including an endless conveyor supporting a plurality of product carriers which move with the conveyor and which can move from side to side on the conveyor with a plurality of guide means mounted under the conveyor for guiding said carriers along predetermined paths as the conveyor moves forward and means for positioning each of said carriers to cooperate with a selected one of said guide means as it moves forward at the input of the conveyor to deliver product to a particular location at the output end of the conveyor.



3,749,226

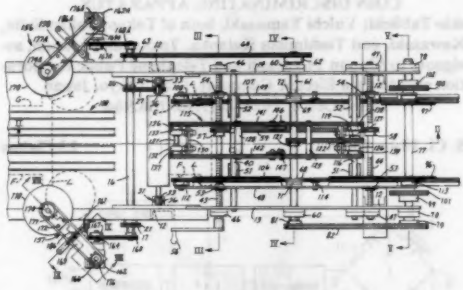
DEVICE FOR CHANGING GRIDS FROM SUCCESSIVE FLAT ARRANGEMENT TO PARALLEL PERPENDICULAR ARRANGEMENT

Harry H. Meschke, Portage, and William J. Stewart, Galesburg, both of Mich., assignors to Kalamazoo Manufacturing Company, Kalamazoo, Mich.

Filed May 21, 1971, Ser. No. 145,850

Int. Cl. B65g 47/24

U.S. Cl. 198—33 AD **11 Claims**



An orientation device for changing an article, such as a battery grid, having a generally flat body portion and a pair of lugs extending laterally outwardly therefrom on opposite sides thereof from a successive flat horizontal arrangement at an input end thereof to a successive upright vertical arrangement at an output end thereof. The device has first and second conveyor mechanisms extending away from the input end. The first conveyor mechanism extends in a first direction and is aligned with the lugs on the grid and is adapted to engage and transport the lugs for movement in the first direction. The second conveyor mechanism is generally below the first conveyor mechanism and extends away from the input end in a downwardly sloping, second, direction defining an acute angle to the first direction. The second conveyor mechanism is

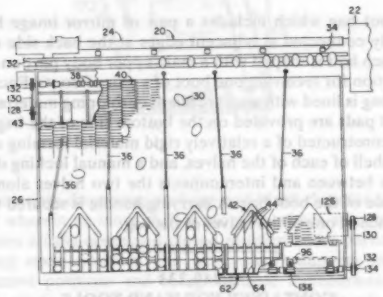
aligned with the generally flat body portion of the grid and is adapted to engage and transport the trailing edge of the flat body portion for movement in the second direction so that the flat body portion is supported from the position adjacent the input end wherein the grid is generally horizontally aligned until a position adjacent the output end wherein the grid becomes vertically aligned after which the grid is supported solely by the lugs on the first conveyor mechanism.

3,749,227

AUTOMATIC EGG RECEIVING AND POSITIONING MACHINE TO ORIENTATE EGGS FOR VACUUM LIFT PLACEMENT IN CONTAINERS

Gerald Denherder, Tacoma, Wash., assignor to National Poultry Equipment Co., division of Dawson & Co., Inc., Renton, Wash.

Filed Sept. 10, 1971, Ser. No. 179,503
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **7 Claims**



The receiving, arranging, and placement of individual eggs into containers for subsequent handling and/or shipment using vacuum egg lifting devices is accomplished more effeciently with greater speed and little or no breakage of eggs through operation of this automatic egg receiving and positioning machine. Each egg generally coming on a conveyor, either from conveyors located throughout a chicken farm or from conveyors receiving cleaned and graded eggs, is gently aligned in a row. Thereafter, it is moved, with its heavier pointed end below and its lighter air cell rounded end above, to join a preselected group of eggs matching the capacity of a container to be filed. Then an air vacuum lifting unit is operated to gently secure each egg, as the group of eggs is quickly transferred to the container. All the eggs, during the transfer, remain positioned with their heavy pointed ends below, as required for their subsequent handling and shipment while so packaged.

This egg receiving, arrangement, and placement machine utilizes the operational advantages gained when high frequency oscillatory motions are created. A chevron arrangement of an egg separator having multiple guides is oscillated back and forth, while slidably supported on a moving wire mesh conveyor, to meet and align the eggs into horizontal rows with their major axes parallel to the directions of both the oscillatory separater movement and the oncoming wire mesh conveyor movement. The chevron egg separator is pivotally secured to the follow on grid having tapered egg support bars adjustably spaced to hold an average size egg, then being processed, near its maximum transverse diameter. The grid is adjustably and flexibly supported on leaf return springs secured in turn to the machine framing. A driven shaft with its motor, both also secured to the machine framing, turns cams, mounted on the driven shaft, to contact cam followers which are replaceably and adjustably mounted on the grid. When the grid is moved, upon each rotation of the cams against the force of its supporting leaf return springs, the grid, in sequence, quickly drops away from a group of eggs, then quickly advances below eggs, abruptly slows down while raising up to meet a different group of eggs, and thereafter returns the new group of eggs at a slower but accelerating pace bringing them automatically into a group configuration, with their heavier pointed ends below, ready for immediate vacuum lifting and placement in containers.

Side by side units are arranged of combined egg separators and grids, often powered by the same motor and its driven shaft with multiple cams, to increase the overall egg orientation capacity. All embodiments have adjustable components easily manipulated to meet the changing operational demands originating when different sized eggs often with different surface conditions are to be received and positioned. Also automatic conveyor shut off control subassemblies are used to avoid any excessive egg quantity build up that might otherwise occur, if conveyor speeds become out of adjustment or any machine or component thereof might fail, and/or an operator might be temporarily absent or otherwise inattentive to the potential or actual excessive build up conditions, which often cause egg shell damage. In each embodiment and in each installation environment each machine is equipped to always carefully and automatically handle each egg, as groups of eggs are arranged for vacuum lifting and packaging with their heavy pointed ends orientated below as required for subsequent handling and shipment.

3,749,228

PROTECTED BELT CONVEYOR

Paolo Magaldi, Via Irno 505, Salerno, Italy

Filed June 14, 1972, Ser. No. 262,709
Int. Cl. B65g *17/12*
U.S. Cl. 198—140 **7 Claims**

A conveyor system having a protected belt driving element on which are mounted a plurality of load bearing elements which compliment one another to provide a protective surface shielding the driving element from conveyed material. The load bearing elements are mounted on the driving element in a spaced manner to essentially insulate the driving element from physical and thermal contact with the conveyed material. Hot loose materials and abrasives may advantageously be transported on this conveyor system which is readily adaptable to existing conveyors.

3,749,229

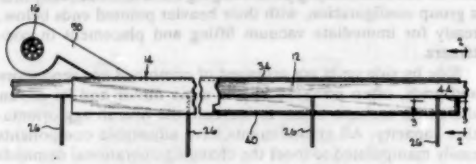
METHOD AND APPARATUS FOR PROTECTING CHAIN CONVEYOR

Stanley C. Napadow, Chicago, Ill., assignor to ILG Industries, Inc., Chicago, Ill.

Filed Feb. 18, 1971, Ser. No. 116,433
Int. Cl. B65 *17/20*
U.S. Cl. 198—177 R **6 Claims**

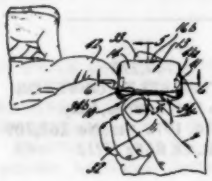
A method and apparatus are provided for protecting a length of conveyor chain from contact by undesirable environmental fluids. In accordance with the method of the invention, a length of conveyor chain is surrounded with a non-deleterious fluid at a pressure higher than the pressure of undesirable

environmental fluids so as to prevent the undesirable environmental fluids from moving into contct with the chain. An ap-



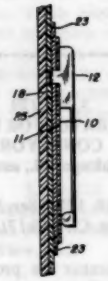
paratus in accordance with the invention includes an envelope to maintain the non-deleterious fluid in surrounding relation to the conveyor chain.

3,749,230
CHILD-PROOF PILL BOX
John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.
Filed May 1, 1972, Ser. No. 248,889
Int. Cl. A45c *13/10*; B65d *83/04*
U.S. Cl. 206—1.5 **14 Claims**



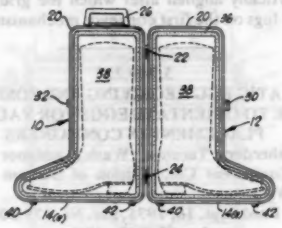
A child-proof container for aspirin tablets and the like comprises a flanged body of resilient plastic and a sheet metal cover hinged thereon and having a hook positively interlocking with a ledge on a flange of the body as the cover is swung closed. By squeezing the assembly edgewise with a pressure greater than a small child can exert, the plastic body is deflected enough to release the ledge from the hook and allow the cover to be opened by the user's other hand while the squeezing pressure is maintained.

3,749,231
SPECTACLE CASE
Emanuel Nathan, South Orange, N.J., assignor to Opticase, Inc., Rockaway, N.J.
Filed Nov. 23, 1971, Ser. No. 201,329
Int. Cl. A45c *11/04*
U.S. Cl. 206—5 R **3 Claims**



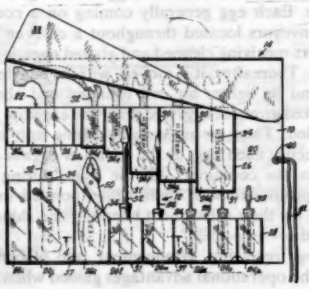
A flexible spectacle case provided with a pocket clip of the type normally used on pocket pens.

3,749,232
BOOT BAG
Floyd W. Craig, 120 N. Church, Cordell, Okla.
Filed Mar. 30, 1972, Ser. No. 190,814
Int. Cl. B65d *85/18*
U.S. Cl. 206—7 G **1 Claim**



A boot bag which includes a pair of mirror image halves pivotally connected at adjacent edges at the back side of the bag. Each half is shaped with a main upper body portion and a toe portion for receiving one boot of a pair of boots. Each half of the bag is lined with a soft resilient cushioning material, and support pads are provided on the bottom side of the bag. The bag is constructed of a relatively rigid material forming an external shell of each of the halves, and a manual locking device extends between and interconnects the two halves along the front side of the boot bag. A carrying handle is secured to the upper side of one of the halves of the bag.

3,749,233
CONTAINER FOR HAND TOOLS
William J. McCormick, Jr., Westport, Conn., assignor to Glendinning Companies, Inc., Westport, Conn.
Filed Nov. 18, 1971, Ser. No. 200,114
Int. Cl. A45c *11/26*; B65d *85/54*
U.S. Cl. 206—16 R **7 Claims**



A container for hand tools, such as wrenches, screwdrivers, a hammer, a pliers and the like, includes a substantially rectangular, opaque, flexible, sheet-like base member. Flexible holding elements are secured in parallel relationship to the base member to define a plurality of pockets, which expand to receive the hand tools. The holding elements are transparent so that the tools are visible within the pockets. Pictorial representations of the hand tools are formed on the base member and are visible through the transparent holding elements so that the tools are placed in the proper pockets. Each representation corresponds to one pocket and to a hand tool to be contained in that pocket.

A package is comprised of the container and of the hand tools disposed in the container.

3,749,234

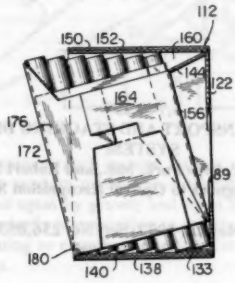
CIGARETTE DISPENSING PACKAGE

Gabriel Gero, Brooklyn, N.Y., assignor to Andre Gero, Brooklyn; Anthony J. Distefano, Huntington Station and Domenik W. Distefano, Ridgewood, all of N.Y., part interest to each

Continuation-in-part of Ser. No. 770,743, Oct. 25, 1968, Pat. No. 3,583,625. This application June 7, 1971, Ser. No. 150,618

Int. Cl. A24f *15/00*

U.S. Cl. 206—41.2 B 25 Claims



A cigarette dispensing package and blank therefor are provided wherein an inner shell is movable within an outer shell between a fully contained closed position and a partially extending open position, the inner shell snapping into the respective positions and being shiftable therebetween by a simple single-handed squeezing operation. Additionally, novel structures are disclosed wherein a blank printed on a single side permits of the presentation of copy on all exposed surfaces; and also, there is disclosed herein certain unique structures affording the snap-lock operation.

3,749,235

STACKABLE PACKAGE WITH LATTICED COVER

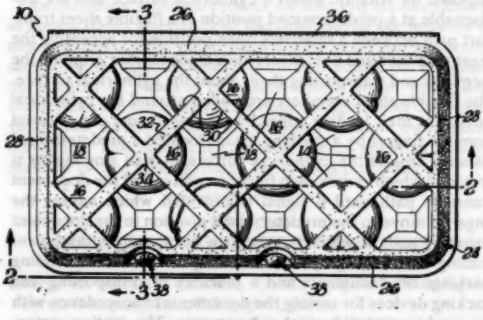
Pierre Boursier, Paris, France, assignor to Keyes Fibre Company, Waterville, Maine

Filed Apr. 9, 1971, Ser. No. 132,781

Claims priority, application France, Sept. 21, 1970, 7034132

Int. Cl. B65d *25/00*, *1/00*

U.S. Cl. 206—45.31 7 Claims



A package for holding a plurality of articles such as fruit for shipment, storage and display comprising a tray having a plurality of downwardly dished article holding pockets and a plurality of upwardly tapering posts dispersed between the pockets and arranged so that when one tray is stacked upon another then the pockets of the upper tray are supported by the posts of the lower tray so that the upper tray does not rest on the articles in the pockets of the lower tray. The package further has a cover which is latticed or grid-like including parallel rows of windows separated by strip-like portions, the windows affording a view of the articles in the pockets for display purposes and permitting another tray to be stacked thereon for shipment or storage purposes. In one embodiment, the windows are centered above the posts whereby the pockets of a tray stacked thereupon extend down through the windows for direct contact with the posts, and in another embodiment the intersection of the strip-like portions contact the tops of the posts whereby the pockets of a tray stacked thereupon rest on such portions for support by the posts. The cover may be hingedly connected to the tray, or the two may constitute independent parts, but in each case latching means is provided to releasably secure the cover to the tray in a closed condition to retain the articles in the pockets.

3,749,236

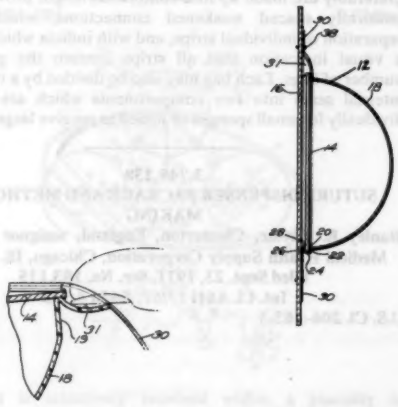
OPENABLE AND CLOSABLE PACKAGE

Nils J. Dahl, Barrington, R.I., assignor to Crystal Thermoplastics, Inc., Cumberland, R.I.

Filed Mar. 17, 1972, Ser. No. 235,835

Int. Cl. B65d *25/00*, *43/10*

U.S. Cl. 206—45.34 6 Claims

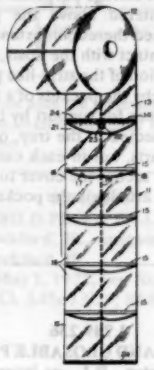


An openable and closable package having a see-through cover, an insert member and a backing member. The cover is in the form of a shell having a first opening of a predetermined dimension in its bottom side with a shoulder extending outwardly from the periphery of the first opening. A wall extends downwardly from the shoulder and has an inwardly extending flange which forms a second opening. Tab members extend outwardly from the flange which forms the second opening and a finger recess is formed in a tab member with the mouth of the recess being in communication with a cutaway portion of the wall and flange. The insert member closes the package and it has an outside peripheral dimension greater than the predetermined dimensions of the first opening of the shell section but less than the peripheral dimension of the opening formed by the wall extending downwardly from the periphery of the shoulder. The backing member is attached to the underside of the cover by staples passing through the tab members which extend outwardly from the bottom of the shell.

3,749,237
BAG STRIP FOR HANDLING SOILED SURGICAL SPONGES

Howard E. Dorton, 108 E. Maxwell St., Lexington, Ky.

Filed Aug. 16, 1971, Ser. No. 172,002
Int. Cl. B65h 55/00
U.S. Cl. 206—57 A 14 Claims

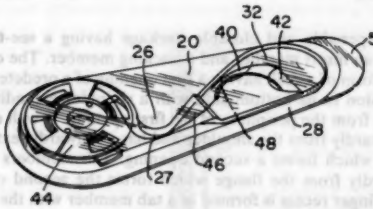


The disclosure concerns an apparatus for handling soiled surgical sponges. The blood soaked sponges are deposited seriatim in transparent bags interconnected in flat vertical strips which preferably are suspended from a scale. After counting or counting and weighing of the sponges, the bag strips containing the sponges are discarded. The bags preferably are made up in a continuous length provided with uniformly spaced weakened connections, which permit separation of individual strips, and with indicia which provide a visual indication that all strips contain the prescribed number of bags. Each bag may also be divided by a rupturable internal seam into two compartments which are used individually for small sponges or joined to receive large sponges.

3,749,238
SUTURE DISPENSER PACKAGE AND METHOD OF MAKING

Stanley E. Taylor, Chesterton, England, assignor to Cenco Medical Health Supply Corporation, Chicago, Ill.

Filed Sept. 23, 1971, Ser. No. 183,115
Int. Cl. A61i 17/02; B65d 81/18
U.S. Cl. 206—63.3 7 Claims

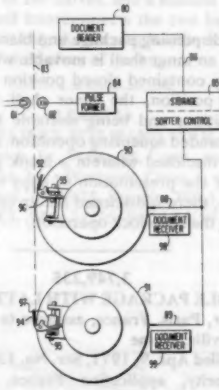


A suture dispenser package for directly dispensing sterile sutures including a molded in depth tray having a circular cavity for receiving a reel means on which an elongated suture is wound, a cavity for receiving a clip means retaining the unwound end of the elongated suture or a needle attached to it, and a narrow passageway between the two cavities which acts to straighten the suture as it is pulled through it. A lid means which is sealable about the periphery of the tray encloses and maintains the suture containing reel and the clip means within their cavities in the tray forming a primary suture pack which may be further enclosed by a secondary package. A method of making a sterile suture dispenser package including, winding an elongated suture about a suture reel, placing the unwound end or suture needle of the suture in a clip means and positioning the reel and clip means in cavities formed in a molded in depth tray, sterilizing the tray and its contents, and sealing a lid to a flange disposed about the upper periphery of the tray, enclosing the tray and its contents. This entire primary suture pack is then enclosed by and sealed within a secondary suture package and externally sterilized through the permeable material forming the secondary suture package.

3,749,239
DOCUMENT TRANSPORT AND STACKING DEVICE AND SYSTEM

John B. Holdway, College Park, Md., and Robert M. Tyburski, Fairfax, Va., assignors to Optical Recognition Systems, Inc., Reston, Va.

Filed May 25, 1972, Ser. No. 256,853
Int. Cl. B07c 3/06
U.S. Cl. 209—74 R 21 Claims



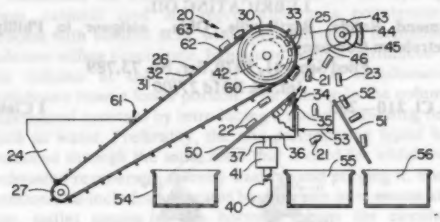
A transporting and stacking device for flexible sheet members such as documents in which a plurality of fingers are disposed for rotation about a cylindrical surface and are displaceable at a predetermined position in a flexible sheet transport path between a relatively open position for accepting the sheet members and a relatively closed position for gripping the members and transporting them about the cylindrical surface. The flexible sheet members are pulled around the cylindrical surface at their leading edges by the fingers and are released from the fingers by a stacking means located a predetermined distance around the cylindrical surface. A wait stop means is provided which causes each finger to wait out of the document transport path until a signal is provided which causes the finger to move to the predetermined position in the document transport path at which it accepts a document. A document reading and sorting system including a device for reading markings on documents and a plurality of transporting and stacking devices for sorting the documents in accordance with the markings read from the documents. The sorting system operates in an asynchronous mode in which a document sensing device located close to the transporting and stacking devices determines when the fingers arrive at the predetermined position in the document transport path.

3,749,240

APPARATUS FOR AND METHOD OF CLASSIFYING EMPTY CONTAINERS

William Spears, and Harry W. Lee, Jr., both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 16, 1971, Ser. No. 208,819
Int. Cl. B07c 5/34
U.S. Cl. 209—75 12 Claims



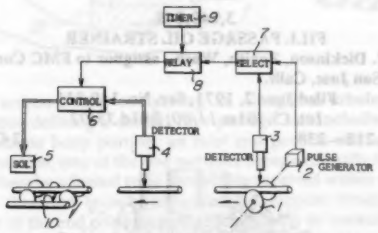
Empty containers, such as cans, bottles, and the like are introduced in a random manner to a classifying station where they are acted upon by gravity and by at least another force which acts basically in opposition to gravity with the force and gravity operating to classify the containers into a plurality of classifications.

3,749,241

PROCESS FOR SELECTING AN OFF-SIZE MATERIAL DURING TRAVEL

Akio Matsuzaki; Kanzi Tsuruoka, both of Tokyo; Tetuo Sada, Yokohama, and Hiroshi Onishi, Hiroshima, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1971, Ser. No. 200,093
Claims priority, application Japan, Nov. 20, 1970, 45/101912
Int. Cl. B07c 5/10
U.S. Cl. 209—82 1 Claim



An automatic selection process for selecting off-size material during travel wherein first, the front end of the material is detected and a pulse count from a pulse generator is started, second, at the time of detecting the rear end of the material, the number of pulses is compared with a preset value, and third, when the compared value does not agree with the preset value, the traveling material is removed from the regular travel line. This process is very effective for rejecting off-size material in tube making, round bar making processes, etc.

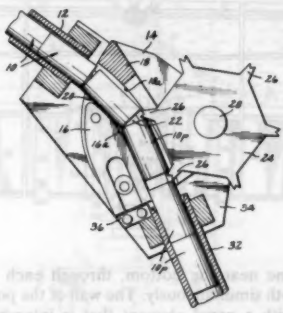
3,749,242

DEVICE FOR SORTING IMPROPER LENGTHS OF ARTICLES

George R. Eckstein, Fairfield, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed May 19, 1972, Ser. No. 255,029
Int. Cl. B07c 5/06
U.S. Cl. 209—123 9 Claims

A device for sorting out improper length articles — either too long or too short — from a mass of articles. The articles to be processed are passed by gravity means in an end-to-end manner through an accurately spaced curved channel which causes fixed width gaps to be located at fixed distances between elongated articles when the articles are uniform length. A star wheel is designed to mesh into the gaps and is driven by a plurality of projections registering much the same as a sprocket driven by a chain. Articles which are either too short or too long will not permit the star wheel to mesh and thus the wheel becomes jammed and the gravity fed line of articles is stopped. Means are provided to permit pivotal movement of the curved channel to an inoperative position to permit easy removal of the improper length article.

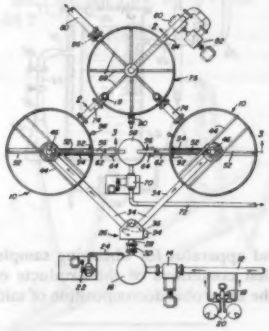


3,749,243

WASTE TREATMENT SYSTEM

James D. Brown, 1405 Marilyn Dr., Little Rock, Ark.

Filed Apr. 30, 1971, Ser. No. 138,897
Int. Cl. B01d 21/24
U.S. Cl. 210—104 9 Claims



Effluent is selectively received within a plurality of clarifiers, each of which incorporates upper and lower surface skimming and sludge removal rake apparatus. A sludge reservoir receives the raked solids for selective removal with the waste water moving from the clarifiers into an aeration chamber where it is subjected to an aeration procedure prior to discharge to a sewer line, stream or pond. The effluent, prior to introduction into the clarifiers, is injected with chemicals to expedite the removal of the solids and air to form particle attaching bubbles for a flotation thereof to the upper skimming area.

3,749,244

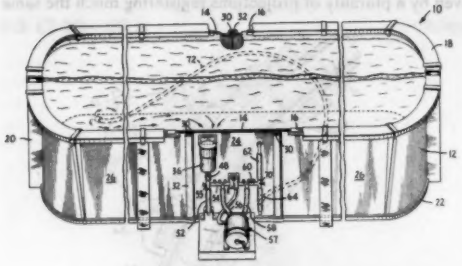
ABOVE-THE-GROUND SWIMMING POOL

Frank Jannuzzi, Jr., 239 Maple Ave., North Plainfield, N.J.

Filed Mar. 3, 1971, Ser. No. 120,541
Int. Cl. E04h 3/20; C02b 1/18
U.S. Cl. 210—169 6 Claims

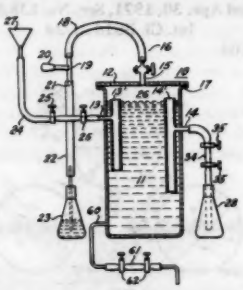
A pool water-conditioning system for installation in an above-the-ground swimming pool is capable of withdrawing

water from the pool through an outlet opening near the top of the pool and one near the bottom of the pool, through each exclusively or through both simultaneously, and of reintroducing the water into the pool through an inlet opening near the



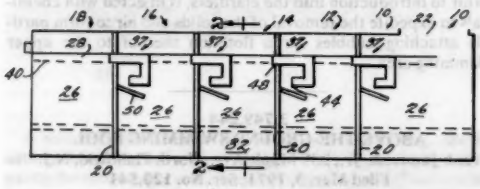
top and one near the bottom, through each exclusively or through both simultaneously. The wall of the pool can be constructed with a panel element that is interchangeable with other panel elements, each of which has pre-formed openings for receiving the components of the pool cleaning system.

3,749,245
LABORATORY DIGESTION TANK
Bela J. Kerecz, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed Apr. 23, 1971, Ser. No. 136,688
Int. Cl. C02c 1/14
U.S. Cl. 210—180 **6 Claims**



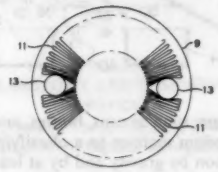
Method and apparatus for obtaining samples under carefully controlled conditions of the products of digestion of materials in the anaerobic decomposition of said materials.

3,749,246
OVERFLOW ARRANGEMENT
William J. Hargraves, 133 Lake Highlander, Dunedin, Fla.
Filed Apr. 19, 1971, Ser. No. 135,353
Int. Cl. B01d 21/08
U.S. Cl. 210—199 **6 Claims**



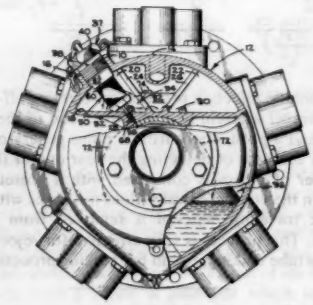
An aerobic sewage treatment system includes a plurality of series-connected aerated digestion chambers. In order to prevent passage of solids from one chamber to the next downstream chamber the liquid connection between the chambers is formed by a specially shaped conduit having an open inlet end disposed within a quiet portion of its respective chamber.

3,749,247
ADDITION OF OXIDATION INHIBITOR TO LUBRICATING OIL
Raymond Rohde, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Sept. 21, 1970, Ser. No. 73,789
Int. Cl. B01d 27/00
U.S. Cl. 210—205 **1 Claim**



Addition of oxidation inhibitor (antioxidant) or other additive to lubricating oil as in a working engine is effected by placing into the oil a container, e.g., a polyolefin container or capsule, for example, a polypropylene capsule containing said additive which permeates through the container wall into the oil gradually. A polypropylene capsule containing zinc dialkyldithiophosphate is described. Other container materials and other polyolefin, e.g., polyethylene and copolymers of monoolefins such as ethylene-propylene copolymers can be used. The container or capsule is found to release increasing quantities of additive as the oil temperature surrounding the same increases, with container rupture at extreme operating conditions of temperature to release remaining additives to further protect the oil under such conditions.

3,749,248
FILL PASSAGE OIL STRAINER
Bryan J. Dickinson, Zenith, Wash., assignor to FMC Corporation, San Jose, Calif.
Filed June 2, 1971, Ser. No. 149,311
Int. Cl. B01m 1/00; B01d 35/02
U.S. Cl. 210—238 **2 Claims**



An oil strainer for insertion into the oil fill passage of a motor housing and projecting beyond the passage to provide a straining surface substantially greater than the diametrical area of the oil fill passage. The strainer incorporates an end cap having a stem receivable in a cavity of the motor housing to maintain the strainer in axial alingment with the oil fill passage and to prevent the strainer from being inadvertently pushed out of the fill passage. A handle is provided for easy removal.

3,749,249

METHOD AND APPARATUS

Leo F. Ryan, Westwood, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Division of Ser. No. 673,111, Oct. 5, 1967. This application Mar. 5, 1971, Ser. No. 121,533
Int. Cl. B01d *15/04*
U.S. Cl. 210—268 1 Claim

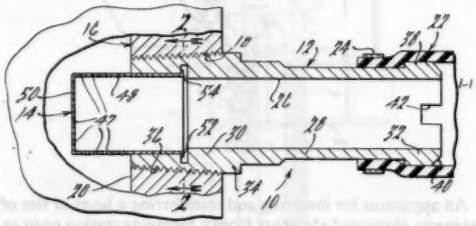
Exhausted ion exchange resin particles of the hydrogen-form, cationic type are regenerated in a countercurrent process with sulfuric acid, while preventing the formation of calcium sulfate precipitate. Exhausted resin is introduced into the column at the top, and material is simultaneously withdrawn from a lower portion. The volume in the column is maintained constant by introducing a non-precipitating liquid such as water. Preferably, the non-precipitating liquid is introduced through the same filter that is used for withdrawing exhausted regenerant, thereby washing and purging it. The invention also includes apparatus having resin inlet means at the top, outlet means at the bottom, means for circulating regenerant, and means for introducing a second liquid near the top. Preferably, the second liquid inlet means and regenerant outlet means communicate with the apparatus through a common filter.

3,749,250

SCREEN FITTING

William G. Oldford, Lexington, Mich., assignor to Huron Tool and Mfg. Co., Lexington, Mich.

Filed Dec. 3, 1971, Ser. No. 204,676
Int. Cl. B01d *27/00*
U.S. Cl. 210—448 10 Claims



A screen fitting comprising an elongated tubular fitting member defining a central flow passage and including an intermediate body portion, an inlet end portion and an outlet end portion, one of the end portions being externally threaded and thereby adapted to be threadably received within an internally threaded bore of an associated support structure, the other of the end portions being formed with an outwardly projecting shoulder and adapted for insertion into the end of an associated fluid conduit, a generally cup-shaped perforate screen member comprising a generally cylindrical side wall section terminating at one end thereof in a generally radially extending end section and at the opposite end in a generally radially outwardly projecting attachment section adapted to be nestingly received within an annular recess formed around the periphery of the flow passage, whereby to operatively secure the screen and fitting members together.

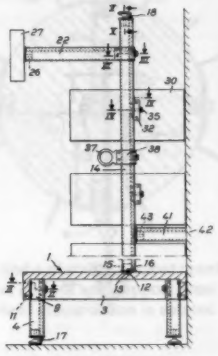
3,749,251

EXTENSIBLE SUPPORT FRAMEWORKS FOR FURNITURE, PARTICULARLY DISPLAY FURNITURE

Jacques Danel, 45, route de Beaumont, 95-Beaumont-sur-Oise, France

Filed Jan. 18, 1971, Ser. No. 107,244
Claims priority, application France, Jan. 14, 1970, 7001274
Int. Cl. A47f *3/14, 5/10*
U.S. Cl. 211—126 5 Claims

This invention relates to an extensible support frame-work for furniture, which comprises a base stand constituted by a plate provided with feet, said plate comprising a longitudinal groove in which is engaged a rail projecting with respect to the surface of the plate and on which uprights are engaged, by a corresponding groove, between which uprights are arranged means for storing and presenting objects, which are fixed to the uprights by assembly means. The invention is used for display furniture for the presentation and arranging of objects.

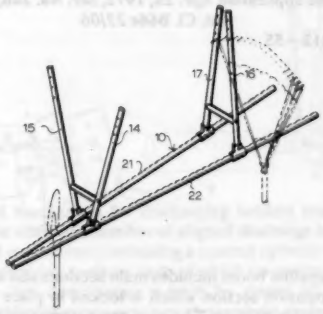


3,749,252

TOOL HOLDER RACK

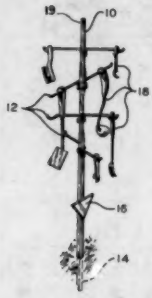
Bernard J. Buschen, 1318 Englewood Ave., Royal Oak, Mich.

Filed Mar. 20, 1972, Ser. No. 236,254
Int. Cl. B25h *3/04*; A47b *47/00*
U.S. Cl. 211—60 T 1 Claim



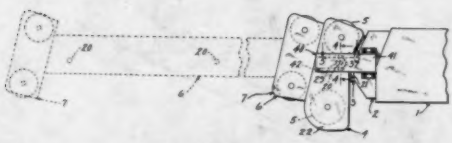
A tool hanger rack structure having two pairs of relatively vertical arms spaced from one another with the arms of each pair pivotally separated by a spacer for scissoring action. The top ends of all the arms are attachable to supporting structure. The bottom ends of like arms of each pair are adjustably connected to relatively horizontal tool hanger poles. The lengthwise extension of the poles between and beyond the arms is adjustable to suit the spacing of support members, to vary the lengthwise spacing between the pairs of arms, and to adjust the lengthwise projection of the poles between and beyond the paired arms. The lateral space between the hanger poles is adjustable by scissoring the paired arms against their respective spacers singly or in combination and in like or opposite directions to move the poles laterally closer together and/or farther apart to accommodate tools of various sizes.

3,749,253
HANGER DEVICE WITH FOLDABLE ARMS
Ray L. Carter, 428 Chestnut St., Phoenix, N.Y.
Filed Nov. 22, 1971, Ser. No. 201,035
Int. Cl. A47f 5/12
U.S. Cl. 211—171 **4 Claims**



A hanger device comprising a central post with a plurality of support arms pivotally connected and movable between folded and extended positions with respect thereto. The arms are each formed of a single piece of metal rod, or heavy gauge wire, and are so formed as to provide a stop for themselves, by contact with the central shaft, when in the extended position. Means integral to the arms and central post are also provided for releasably maintaining the arms in the folded position, wherein the device is more compact for storage or transport.

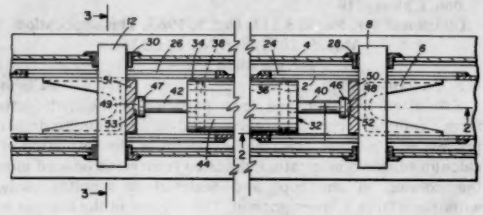
3,749,254
BOOM EXTENSION LOCK
Lyle D. Grider, New Berlin, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Continuation of Ser. No. 111,381, Feb. 1, 1971, abandoned.
This application Apr. 28, 1972, Ser. No. 248,777
Int. Cl. B66c 23/06
U.S. Cl. 212—55 **8 Claims**



An extensible boom includes main sections and a separately driven extension section which is locked in place by pins on the outer main section. The pins are automatically retracted by means of cam followers actuated by cam tracks on an inner section, and the pins and tracks are near the ends of their sections so that the extension section is operable only when the main sections are substantially retracted. The cam followers operate through override springs to prevent damage, and the pins have enlarged ends which effectively prevent operation of the extension until its drive is actuated.

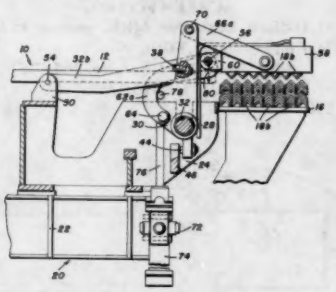
3,749,255
CUSHION UNDERFRAME
Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Mar. 18, 1971, Ser. No. 125,748
Int. Cl. B61g 9/16
U.S. Cl. 213—8 **6 Claims**

Cushion underframe containing a double ended spring with a precompressed compressible material therein adapted for use in a fixed position within the floating sill of a railway car



and located substantially centrally of the car for cushioning the forces derived from the couplers at each end.

3,749,256
MAGNETIC INVERTER
William J. Hill, Holden; Raymond R. Starvaski, and Harold E. Woodrow, both of Worcester, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.
Filed Oct. 13, 1971, Ser. No. 188,987
Int. Cl. B65g 57/04
U.S. Cl. 214—1 Q **7 Claims**

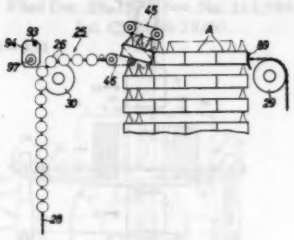


An apparatus for inverting and transferring a layer or tier of magnetic elongated elements from a receiving station onto an adjacent elevator. The apparatus includes a plurality of electromagnets, each of which is pivotally mounted for movement about a common axis between a first position underlying the receiving station and a second position overlying the elevator. A linkage arrangement is provided for vertically adjusting the pivotal axis of the magnets during transfer of the elements onto the elevator.

3,749,257
UNLOADING MACHINE
Umeo Yamashita, Osaka, Japan, assignor to Yamashita Iron Works Ltd., Osaka, Japan
Filed July 8, 1971, Ser. No. 160,710
Claims priority, application Great Britain, Nov. 19, 1970, 55,084/70
Int. Cl. B65g 59/02
U.S. Cl. 214—8.5 A **2 Claims**

This machine unloads articles piled up in layers on a pallet successively from the uppermost layer. The machine includes a movable conveyor adapted for horizontal reciprocal movement between a predetermined front position and a rear position to send out the articles rearward and an elevator for supporting articles on the pallet in the path of movement of the conveyor. The movable conveyor is provided, at its front end with a lower endless belt for scooping up the articles in frictional contact therewith and an upper endless belt disposed above the lower endless belt for preventing the articles from tumbling during scooping-up operation. These belts are driven in the direction to send out the articles rearward by a motor

fixedly mounted on part of a support structure by way of chain-sprocket transmission mechanism. The upper and lower



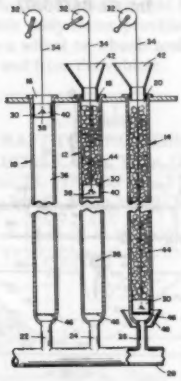
endless belts are adapted to be driven at a higher velocity when the movable conveyor is moved forward than when it is retracted.

3,749,258

THERMALLY REMOVABLE SUPPORT MEANS FOR LOADING LONG VERTICAL VESSELS

Maurice L. James, Pinole, Calif., assignor to Calcatco, Inc., Richmond, Calif.

Filed Feb. 9, 1972, Ser. No. 224,899
Int. Cl. B65g 65/30
U.S. Cl. 214—17 C 13 Claims



Method for loading long vertical columns or vessels with friable particulate matter employing a solid mass of material, substantially conforming to the inner shape of the column, wherein the material is normally a fluid at ambient or mildly elevated temperatures. The mass is supported by a line, such as a cable.

The mass is introduced into the upper end of the column, and lowered slowly as the friable particulate matter is introduced into the column until the column is filled, and the mass has descended to the bottom of the column. The mass then melts or evaporates, leaving a filled column substantially free of broken particulate matter as a result of impact from a long fall in the column.

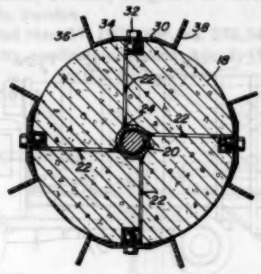
3,749,259

WHEEL CONSTRUCTION FOR SILO UNLOADER

Erwald E. Stock, Route 3, Manitowoc, Wis.

Filed Mar. 2, 1972, Ser. No. 231,209
Int. Cl. B65g 65/38
U.S. Cl. 214—17 DB 10 Claims

A wheel construction for advancing a silo unloader over the surface area of silage, said wheel construction comprising a hub element adapted to be connected to a drive shaft, a plurality of spaced rigid support arms attached to and diverging outwardly from said hub element, a heavy, generally cylindrical core of cementitious material substantially encapsulating



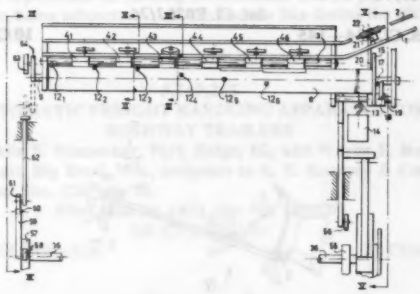
said support arms, and a plurality of cleat members removably fastened to the outer ends of said support arms for digging into the silage as the wheel construction is rotated to advance the unloader.

3,749,260

DEVICE FOR SUCCESSIVELY DISCHARGING OBJECTS FROM HOLDERS

Jacob H. Mosterd, Stationsweg 117, at Barneveld, Netherlands

Filed June 25, 1971, Ser. No. 156,836
Claims priority, application Netherlands, July 1, 1970, 7009762
Int. Cl. B65g 47/46
U.S. Cl. 214—60 7 Claims



A control mechanism for discharging holders moving the one after the other at a number of aligned discharge locations, said control mechanism containing a control cylinder having a number of stopping surfaces each of which co-operates with a latch, such that deactivating a latch by means of a holder makes the cylinder rotate over a predetermined angle for positioning corresponding discharge abutments in the path of the discharge catch of a holder.

3,749,261

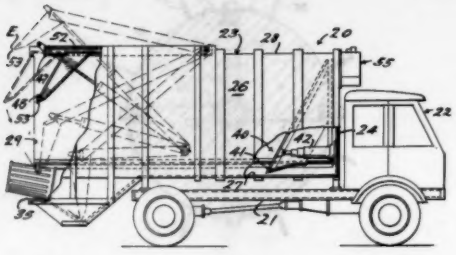
REFUSE COLLECTING VEHICLE

William A. Herpich; Glenn S. Park, both of Galion, Ohio, and George W. Palmer, Durant, Okla., assignors to Peabody Galion Corporation, Galion, Ohio

Division of Ser. No. 28,566, April 5, 1970, Pat. No. 3,661,281.
This application Dec. 29, 1971, Ser. No. 213,582
Int. Cl. B65f 3/00
U.S. Cl. 214—82 8 Claims

This invention relates to a rear end loader type of refuse collecting vehicle. There is no tailgate and the loading hopper, rather than being in the tailgate, is in the rear of the vehicle body. A packing blade moves refuse from the hopper into the forward portion of the body and in one embodiment may be

reversed to sweep refuse from the hopper to a point exterior of the vehicle. A longitudinally movable ejector panel is mounted transversely of the body. During the discharging of refuse from the open rear end of the body the packer blade is



in an elevated position and the refuse is discharged by the ejector panel between the elevated packer blade and the hopper. In some embodiments an auxiliary floor is provided in the hopper.

3,749,262

POWER SHOVEL WITH SCRAPER BLADE RELEASABLY ATTACHED TO THE SHOVEL BUCKET

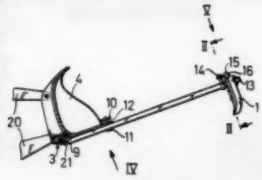
Hubert Stark, Fontanella, Austria, assignor to Terramot-Beteiligungs-GmbH, Ravensburg, Germany

Filed July 14, 1972, Ser. No. 271,706

Claims priority, application Austria, July 20, 1971, A 6319/71

Int. Cl. E02f 3/76

U.S. Cl. 214—145 **10 Claims**



An arm releasably pivoted to the underside of the bucket in a power shovel projects beyond the shovel in the normal direction of movement of the vehicular base of the shovel, and its free end carries a tiltable scraper blade. The arm may be secured on the bucket, and the blade may be secured on the arm in several fixed angular positions so that the blade may be employed for scraping and shaping embankments of a road on which the power shovel moves, such embankments not being accessible to the bucket unless the power shovel moves at right angles to the direction of the road.

3,749,263

METHOD FOR TRANSFERRING A LOAD FROM A FIRST SUPPORT TO A SECOND SUPPORT

Georges Foury, Plessis-Robinson, France, assignor to Compagnie Generale d'Automatisme, Paris, France

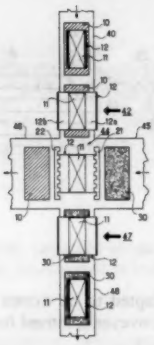
Filed July 2, 1971, Ser. No. 159,317

Claims priority, application France, July 2, 1970, 7024561

Int. Cl. B65g 7/00

U.S. Cl. 214—152 **4 Claims**

A load is transferred from a first support to a second support by tensioning a transfer sheet lying between the load and the first support to raise the load from the first support and



then a second support is slid under the load to replace the first support prior to releasing the tension on the transfer sheet.

3,749,264

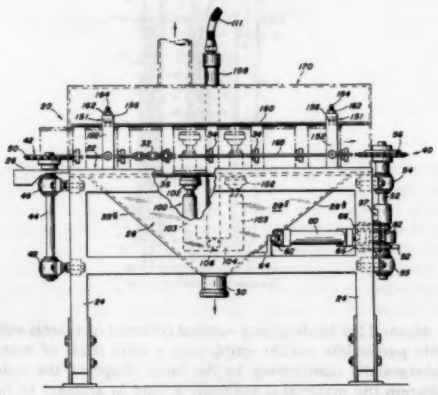
APPARATUS AND METHOD FOR REMOVING AND STORING PASTE-LIKE MATERIAL FROM CONTAINERS

John T. Steinle, and Carl H. Brooks, both of Fremont, Ohio, assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Jan. 6, 1971, Ser. No. 104,393

Int. Cl. B65f 3/02

U.S. Cl. 214—302 **2 Claims**

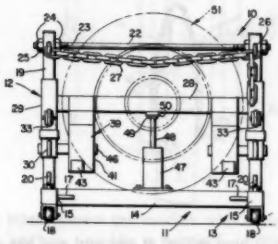


An apparatus and method for removing and storing soft plastic material, such as tomato paste, for example, from containers is disclosed. The apparatus, which provides means by which the method may be practiced, includes a hopper for receiving and storing the material and a conveyor arranged above the hopper for transporting downwardly facing open containers over the hopper. Restraining means is disposed adjacent the containers for guiding the containers over the hopper and for preventing unrestricted upward and lateral movement of the containers. Pressure means in the form of an ejection head coupled to a source of pressurized steam is arranged within the hopper and below the open containers. Containers are stopped at a position to allow the ejection heads to enter within the confines of the container while steam is being discharged and thereby force any residual paste off of the interior of the containers and into the hopper. The pressure means of the disclosed apparatus includes a pair of parallel pressure heads whereby two successively spaced containers are subjected simultaneously to pressurized steam.

3,749,265
WHEEL DOLLY

Raymond P. Smith, Jr., 120 W. Lincoln Ave., So. Williamsport, Pa.

Filed Dec. 28, 1971, Ser. No. 212,999
Int. Cl. B60b *29/00*
U.S. Cl. 214—331 1 Claim

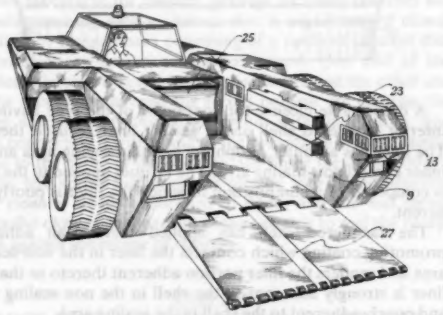


A wheel dolly to facilitate mounting and demounting large vehicle wheels and tires, including brake assemblies, and which is especially adapted for use in connection with dual rear truck wheels. The dolly includes a lift frame on which the wheels and tires are supported for raising and lowering the wheels and tires to facilitate their removal from or application to a vehicle. A mobile dolly frame provides a support for the lift frame to enable a wheel or wheels and tire or tires to be readily conveyed to and from the vehicle.

3,749,266
AIRCRAFT TOWING VEHICLE

Jerry Dale Gordon, 10765 E. 11th, Tulsa, Okla.

Filed Dec. 23, 1971, Ser. No. 211,327
Int. Cl. B60p *29/00*
U.S. Cl. 214—334 5 Claims

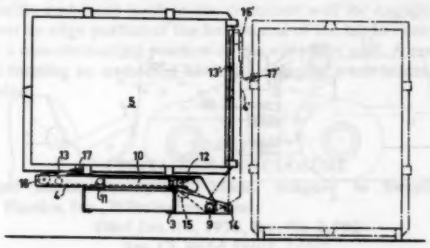


An aircraft towing vehicle has a central well closed by a gate that swings down to form a ramp and that is pushed under the nose wheel unit of the aircraft while the other wheels of the aircraft are locked. Power-operated jaws on the sides of the well clamp the nose wheel unit between them; and when the unit is a tandem unit, then a power-operated ram bar at the inner end of the well secures the unit between the ram bar and the closed gate. The vehicle is steerable by driving for pivoting about the vertical pivotal axis of the nose wheel.

3,749,267
APPARATUS FOR TILTING OR OVERTURNING A CONTAINER, E.G., FOR REFUSE

David Georg Lindeborg, and Ake Bertil Ingemar Dahlin, both of Blomstermala, Sweden, assignors to Norba Aktiebolag, Blomstermala, Sweden

Filed Mar. 27, 1972, Ser. No. 238,344
Claims priority, application Sweden, Apr. 1, 1971, 4231/71
Int. Cl. B60p *1/04*
U.S. Cl. 214—501 6 Claims

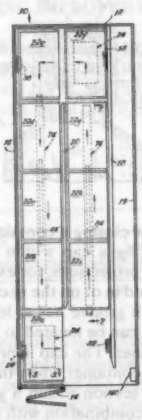


A container, e.g., for refuse, rests upon a pivotable support frame or the like on a preferably wheeled chassis and is pivotable upwards from a substantially horizontal position to a substantially vertical position by means of preferably hydraulic jack or ram. The container is hoisted up on to the frame and lowered therefrom, e.g., to the ground, while being rotated 90°, by pivoting the frame. At least one wire or the like, which is secured to a stationary fastening point in a selected position on said chassis and therefrom runs over a first pulley or the like and from said pulley extends to a fastening on the container is provided for holding the container and for preventing it from being subjected to shocks and the like during the tilting operation.

3,749,268
AUTOMATIC FREIGHT HANDLING APPARATUS FOR HIGHWAY TRAILERS

Franklin S. Macomber, Park Ridge, Ill., and Wayne E. Hunnicutt, Big Bend, Wis., assignors to A. T. Kearney & Company, Inc., Chicago, Ill.

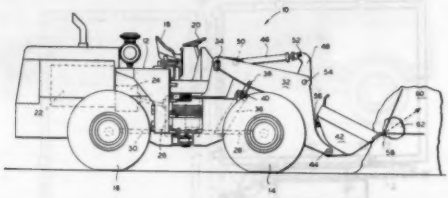
Filed June 16, 1971, Ser. No. 153,758
Int. Cl. B60p *1/64*
U.S. Cl. 214—516 21 Claims



Apparatus mounted within a highway trailer or the like which automatically moves a predetermined number of cargo containers along a predetermined endless path within the

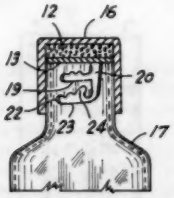
trailer for the purpose of locating a selected cargo container in a predetermined loading and unloading position.

3,749,269
CONTROL SYSTEM FOR A VEHICLE ENGINE
Marcus L. Conrad, Stevensville, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed July 23, 1971, Ser. No. 165,547
Int. Cl. E02f *3/86*
U.S. Cl. 214—762 **12 Claims**



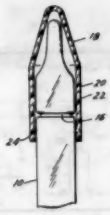
A vehicle having a tiltable load engaging bucket and elevatable booms connecting the bucket to the vehicle is provided with a control system having a pressure sensitive switch connected to sense the fluid pressure required to raise or tilt the bucket. The switch is adapted to actuate when the fluid pressure exceeds a level indicating that the bucket has encountered and obstruction in its work, and upon the switch's actuation a governor is activated to reduce the speed of the vehicle's engine so that the vehicle moves forward more slowly and the lifting bucket has an opportunity to lift past the obstruction.

3,749,270
SAFETY CLOSURE FOR A CONTAINER
Lyle Claud Affleck, 30 Albert Parade, Ashfield, Australia
Filed Feb. 12, 1971, Ser. No. 114,951
Claims priority, application Australia, May 25, 1970, 1305
Int. Cl. B65d *43/02*
U.S. Cl. 215—9 **12 Claims**



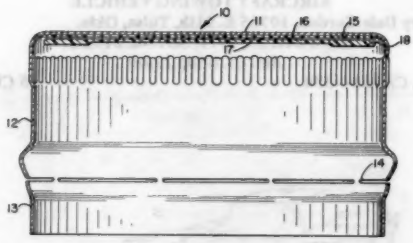
An arrangement, for closing a container such as a bottle or like container, including a cap within the skirt of which is mounted one or more projections, for example, pins. Each pin fits into a groove formed in or on the neck or similar formation on the container. Each groove has at least one indent within which the inserted pin can be located to hold the cap in a position to seal the container. The cap is provided with means to bias it away from the container when the latter is sealed, and an enlarged indented section within a groove is used so that the biassing action in combination with the enlarged indented section provide a closure for the container which cannot be easily undone by young children. In another arrangement, the pins are located on the container and the grooves within the cap.

3,749,271
RESEALABLE AMPOULE CLOSURE
Donovan Russell Ellis, Jr., Princeton, N.J., and Bernard Frank Markiewicz, Lutherville, Md., assignors to Becton, Dickinson and Company, East Rutherford, N.J.
Filed June 22, 1971, Ser. No. 155,518
Int. Cl. B65d *1/02, 17/24*
U.S. Cl. 215—32 **6 Claims**



A glass ampoule is heat sealed at one end and has a necked down annular break line formed adjacent to but spaced from the sealed end. A plastic cap having two spaced annular sealing rings formed on an inner wall is pressed on the sealed end so that the break line is between the spaced sealing rings.

3,749,272
DEFORMABLE CLOSURE FOR CONTAINERS
Halford E. Brockett, Elmhurst, and Robert C. Melberg, Flossmoor, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed May 8, 1972, Ser. No. 250,995
Int. Cl. B65d *53/04*
U.S. Cl. 215—40 **5 Claims**



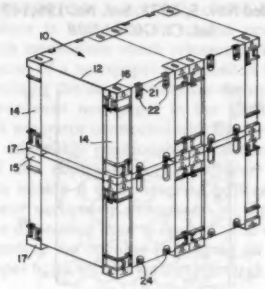
A deformable closure for containers of the type having an interior lacquered shell and a sealing liner secured therein. The liner has an outer peripheral annular sealing area and an inner central non-sealing area. The lacquer applied to the shell is composed of a composition to which the liner is poorly adherent.

The lacquered shell has applied thereto an adhesion promoting coating which contacts the liner in the non-sealing area and renders the liner portion adherent thereto so that the liner is strongly adherent to the shell in the non-sealing area and poorly adherent to the shell in the sealing area.

3,749,273
MODULAR CONTAINER
Kenneth W. Wreghitt, Andover; Peter Shirley Pusey, Marblehead, and Donald Gilbert Munro, Chelmsford, all of Mass., assignors to Avco Corporation, Wilmington, Del.
Filed May 17, 1971, Ser. No. 143,758
Int. Cl. B65d *87/00*; B65j *1/02*
U.S. Cl. 220—1.5 **18 Claims**

The disclosure illustrates a container module adapted to be readily interconnected with a series of identical modules to

form an array of containers that may be configured to standard forms suitable for use with standard handling equipment. The container has vertical structural corner posts having releasable latches adjacent their upper and lower ends to



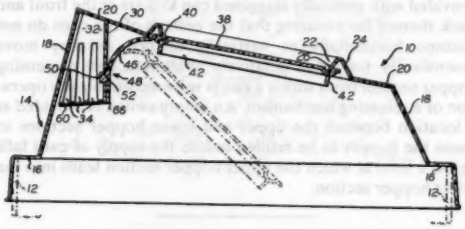
laterally interconnect the module with adjacent modules. Additional latches provide a vertical connection with other stacked modules. A number of specific latch arrangements are disclosed.

3,749,274

RECEPTACLE WITH SPRING HINGE CLOSURE

Sidney C. Mele, Mountainside, and Earl Hoyt, Westwood, both of N.J., assignors to Blessings, Inc., Bound Brook, N.J.

Filed Aug. 16, 1971, Ser. No. 171,968
Int. Cl. B65d *43/16*
U.S. Cl. 220—31 S **14 Claims**



This receptacle for diapers, garbage or other contents has an inlet opening with a closure that is urged toward closed position by hinge means consisting of a resilient element that is flexed to an arc of substantial extent. One end of the resilient element is connected to the closure and the other end to the receptacle beyond the flexed portion. By molding the hinge means in substantial alignment with the closure, and then connecting it with a wall of the receptacle at a substantial angle to the plane of the opening, the hinge means provides a plastic leaf spring that urges the closure into closed position. The closure moves downward to open, and the leaf spring holds the closure against a lip of the opening to seal the receptacle against the escape of odors.

3,749,275

LOCK-DOWN FOR A PULL TAB ON A CONTAINER WALL

George L. Smith, Jr., Vandergrift, and Hans H. Diekhoff, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 27, 1971, Ser. No. 212,562
Int. Cl. B65d *17/00*
U.S. Cl. 220—48 **4 Claims**

An easy opening device is provided which includes a score line in the container wall defining an opening flap adjacent an edge of the container wall and a tab having a nose end overlying the opening flap and affixed thereto and a handle end toward the opposite edge of the container wall with a line of weakening in the tab between its nose and handle ends for depressing the handle end of the tab to a non-obstructing position on the container wall, and which further includes an up-

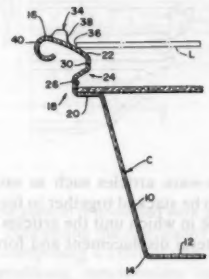
wardly embossed hook in the container wall for engagement over an edge portion of the handle end of the tab to restrain it in a non-obstructing position on the container wall. A method of forming an embossed hook for engaging a tab is also provided.

3,749,276

CONTAINER AND CLOSURE

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Jan. 14, 1970, Ser. No. 2,792
Int. Cl. B65d *39/02, 21/02*
U.S. Cl. 220—60 R **4 Claims**



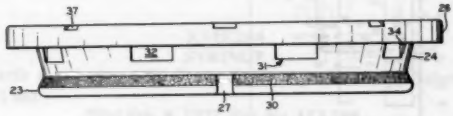
A thin wall plastic container having a rim-type nesting ring which also serves as a lid seat and includes protuberances spaced about the rim for centering a paper tab-type lid so that it may be snapped in place into the lid seat merely by the application of downward pressure.

3,749,277

CLOSURE HAVING IMPROVED RESISTANCE TO UNSEATING

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 1, 1971, Ser. No. 194,141
Int. Cl. B65d *43/10, 5/64*
U.S. Cl. 220—60 R **5 Claims**



A closure is provided with a retention bead structure for engaging a corresponding bead retention groove in a packaging container. At least a portion of the surface of the upper portion of the retention bead structure which contacts the upper portion of the bead retention groove is provided with a rough texture to increase the coefficient of friction thereof, thereby increasing the resistance of the closure against unseating after the closure has been inserted into the container. The coeffi-

cient of friction of the lower portion of the retention bead structure can be significantly lower than the coefficient of friction of the upper portion thereof to minimize resistance against the insertion of the closure into the container.

3,749,278

SET OF DIFFERENT DINNER-WARE ARTICLES

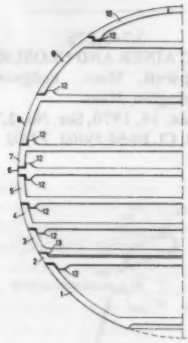
Marie Helene Isabella Antonia von Boch-Galhau, Britten, Germany, assignor to Villeroy & Boch Keramische Werke AG, Mettlach/Saar, Germany

Filed May 6, 1971, Ser. No. 140,906

Claims priority, application Germany, May 12, 1970, P 20 22 968.9

Int. Cl. A47g *19/00*

U.S. Cl. 220—23.83 **20 Claims**



A set of dinner-ware articles such as saucers, plates and bowls is adapted to be stacked together to form a portable unit of a compact shape in which unit the articles are safe-guarded against relative lateral displacement and form a substantially closed shell.

3,749,279

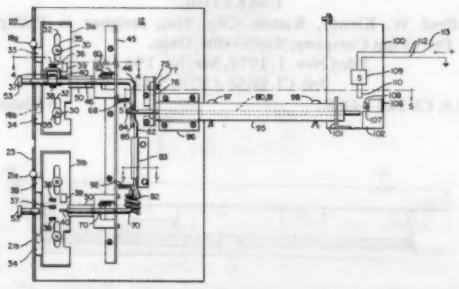
APPARATUS FOR DISPENSING ARTICLES AND REGISTERING CHARGES THEREFOR

Warren J. Ungerman, Hatboro, Pa., assignor to Captain International Industries, Ltd., Vancouver, Canada

Filed Jan. 21, 1972, Ser. No. 219,639

Int. Cl. A47g *29/124*

U.S. Cl. 221—7 **28 Claims**



An article dispensing apparatus in which goods to be dispensed are kept in individual compartments having gates initially locked closed and then unlocked in succession upon cyclic operation of a gate control device to provide access for removing by hand the contents in each respective compartment. As each gate is unlocked, an electrical signal is transmitted for recording the charge of the goods in that respective compartment.

3,749,280

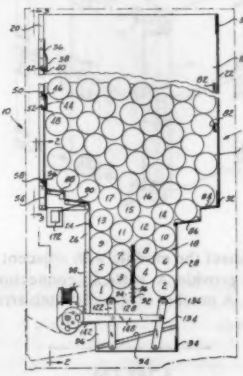
BULK LOADING CAN DISPENSER

Ronald Gale, deceased, late of Orlando, Fla. (by Mae Gale, executrix), assignor to Rowe International, Inc., Whippany, N.J.

Filed Nov. 5, 1971, Ser. No. 196,147

Int. Cl. G07f *11/08*

U.S. Cl. 221—67 **15 Claims**



A bulk loading can dispenser for delivering cans of beverage or the like in response to the deposit of coins, for example, in which cans may be randomly stacked in an upper relatively deep hopper portion having a width approximating the height of a can upon removal of retaining elements at the front of the upper hopper portion in which the upper hopper section is provided with vertically staggered can kickers at the front and back thereof for ensuring that the centers of the cans do not become horizontally or vertically aligned as they move downwardly toward a relatively shallower can dispensing hopper section from which a can is released upon each operation of a releasing mechanism. An empty switch is provided at a location between the upper and lower hopper sections to cause the hopper to be refilled before the supply of cans falls below a level at which the upper hopper section leads into the lower hopper section.

3,749,281

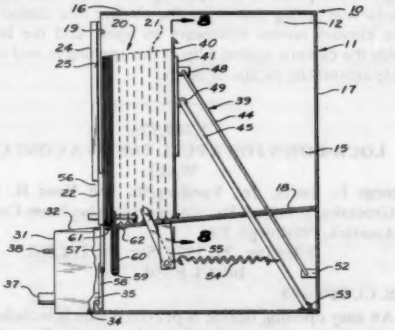
NEWSPAPER VENDING MACHINE

Bessie T. Stovers, 2423 Louis Road, Palo Alto, Calif., and Richard E. Ehnert, 1076 Reed Ave. Ap. No. 81, Sunnyvale, Calif.

Filed Feb. 8, 1971, Ser. No. 113,450

Int. Cl. G07f *11/28*

U.S. Cl. 221—298 **6 Claims**



A vending machine for articles such as newspapers and the like. The machine includes a chamber defining a storage

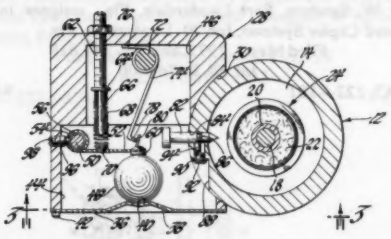
magazine in which newspapers are arranged in a stack supported in a generally vertical orientation with their folded edges seated upon the inclined bottom wall of the chamber. A pusher plate assembly urges the stack of newspapers forwardly toward an opening that is normally closed by a dispensing door. The door is locked in its closed position by coin-operated latch mechanism which releases the door when coil totaling the cost of a newspaper is deposited in the machine, thereby permitting the door to uncover the opening and enable the forwardmost newspaper in the stack thereof to be withdrawn. A separator connected with the door so as to move therewith is adjustably positionable in accordance with the thickness of the copies of any particular edition of the newspaper to enable it to be inserted between the forwardmost and next successive newspaper in the stack thereof whenever the dispensing door is opened. The separator forms a barrier guarding the opening to prevent all except the forwardmost paper to be withdrawn therethrough.

3,749,282

SENSOR AND TRIGGER MECHANISM

Edward G. Day, Rochester, and Guy E. Giannone, North Chili, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1971, Ser. No. 130,631
Int. Cl. B67b 7/24
U.S. Cl. 222—5 **2 Claims**



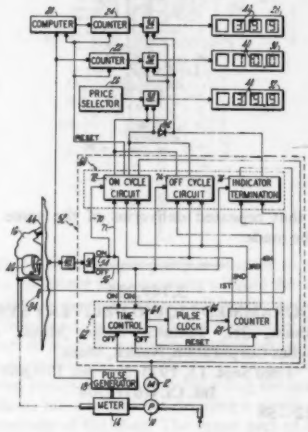
A sensor and trigger mechanism of the type including a pressure vessel having an outlet secured to a cylindrical support member and sealed by a rupturable diaphragm. An axial guide pin mounted on the support extends through an axial opening in an intermediate wall of the support and slidably supports a penetrator pin for rupturing the diaphragm. The open ends of a hollow frangible glass cylinder seat between the support wall and the pin. The particular mechanism disclosed includes a ball of predetermined weight seated on a frustoconical pedestal and held against movement by a lever arm pivoted at one end and mounting a pressure pad on the free other end thereof engaging the ball diametrically opposite the seat. A coil compression spring engages an intermediate portion of the lever. The spring seats on an embossment of the arm and on a threadedly adjustable guide pin. The free end of the lever arm includes two lateral tangs which engage the bight portion of a torsion spring to detent the bight portion against movement. A fragmentor pin is slidably mounted on the support for engagement with the glass cylinder when engaged by the bight portion of the torsion spring. A threaded nylon member includes a deflectable tang which engages an annular groove in the shank of the fragmentor pin to releasably detent the pin against movement. When the glass cylinder is fragmented, a compression spring engaging the head of the penetrator pin moves the penetrator pin into engagement with the diaphragm to rupture the diaphragm and release the contents of the pressure vessel for inflation of an occupant restraint cushion.

3,749,283

FUEL DISPENSING SYSTEM WITH INDICATOR VERIFICATION MEANS

Howard W. Nelson, Middletown, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 184,098
Int. Cl. B67d 5/16
U.S. Cl. 222—27 **10 Claims**



A fuel dispensing system is provided with an indicator verification system for confirming the operability of segmented numeral indicators comprising a control unit operable between ON and OFF positions; synchronizer logic circuitry for sequentially visualizing and blanking all segments of the segmented numeral indicators and a timer circuit for programming the operation of the synchronizer circuit. The control unit is operatively connected to the synchronizer logic circuitry and to the timer circuit for activating the synchronizer to visualize all segments of the indicators and initiate operation of the timing circuit upon operation of the control means to its ON position. Timed interval operation of the timer circuit automatically terminates full segment visualization, initiates and terminates blanking of the indicators, resets the counters of the fuel dispensing system and conditions the fuel dispensing system for dispensing fuel. Upon completion of the fuel delivery, operation of the control unit to its OFF position initiates recycling of the verifying sequence followed by termination of the indicator display readout after an appropriate time interval.

3,749,284

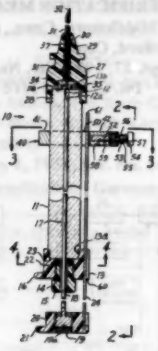
SYRINGE

Garth A. Kloehn, 1320 Estate Drive, Apt. No. 1, La Habra, Calif.

Filed Feb. 8, 1971, Ser. No. 113,288
Int. Cl. G01f 11/06
U.S. Cl. 222—43 **2 Claims**

A syringe according to this invention comprises a body having a bore in which a plunger is reciprocably mounted. A thumbpiece is attached to the plunger and calibrator means is mounted to the thumbpiece to reciprocate with the plunger. Means mounted to said body cooperates with the calibrator means to enable determination of the volume of fluid in the bore. Preferably, and according to one feature of the syringe, the plunger is threadably assembled to said thumbpiece to per-

mit adjustment of the relative position of said plunger with respect to said calibrator means. Stop means may be positioned so that repeated deliveries of the same quantity of fluids can be made.



3,749,285

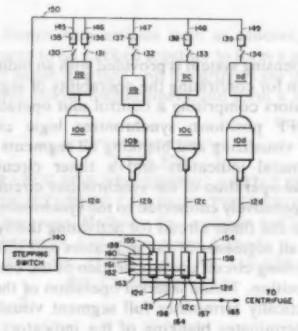
PROGRAMMED LIQUID DELIVERY SYSTEM

Allen Latham, Jr., Jamaica Plain, Mass., assignor to Haemonetics Corporation, Natick, Mass.

Filed Sept. 13, 1971, Ser. No. 179,869

Int. Cl. G01f 1/04

U.S. Cl. 222—58 **10 Claims**



Fluid dispensing program method and apparatus designed to be preset to deliver a predetermined weight of one or more liquids in sequence. When the exact preset weight of liquid is delivered from any one liquid reservoir a sensing means is triggered by the upward motion of a weighing means responsive to a decrease in weight from which the reservoir is suspended. The sensing means directs a signal to a stepping switch which effects a closing off of liquid flow and the actuation of the next step in the protocol being followed. Rates of liquid flow may be controlled if desired. The system is particularly suitable for controlling amounts of different liquids to a centrifuge during deglycerolization of red blood cells.

3,749,286

ACTUATOR CAP WITH ACTUATION DISABLING MEANS

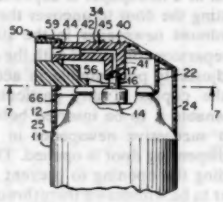
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,916

Int. Cl. B65d 83/14; B67d 5/32

U.S. Cl. 222—153 **4 Claims**

An actuator cap for use with conventional pressurized containers having a slidable locking member which prevents accidental discharge of the container contents. The slidable locking member has a flat base having one end bifurcated. The locking member is mounted to the actuator cap so that when moved to lock position its bifurcated end wedges between the actuator and the container preventing movement of the actuator so that the container valve is not opened to discharge contents. The slidable locking member may also be provided with a sleeve-like segment attached to the base. This sleeve-like segment telescopically fits over a horizontal spout provided for the actuator cap. This modified slidable locking member has the dual function of actuator lock and spout extender.



3,749,287

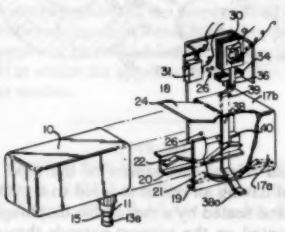
TONER CONTAINER AND HOLDER FOR ELECTROSTATIC COPIERS

Isaac W. Sanders, Fort Lauderdale, Fla., assignor to Automated Copier Systems, Inc, Ft. Lauderdale, Fla.

Filed May 3, 1972, Ser. No. 249,819

Int. Cl. B67d 3/00

U.S. Cl. 222—181 **9 Claims**



A liquid toner dispenser, adapted for installation as a unit in a new or pre-existing electrostatic copier, comprises a toner bottle provided with a metering valve assembly and associated with a supporting bracket adapted to be positioned adjacent an access door in the electrostatic copier. The bracket is provided with guideways adapted to receive the bottle through the opening created by the access door, and cooperating with the access door to properly position the valve assembly of the toner bottle adjacent a manually or automatically actuatable electromechanical operator affixed to the bracket and functioning, when actuated, to dispense a predetermined amount of liquid toner from the toner bottle.

3,749,288

LIQUID DISPENSER

Charles H. Wade, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

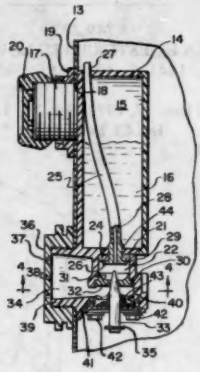
Filed Sept. 9, 1970, Ser. No. 70,772

Int. Cl. B67d 3/00

U.S. Cl. 222—187 **13 Claims**

A liquid dispenser in which a liquid is transferred from a supply chamber in a preselected maximum amount to a meter-

ing chamber where it is ejected as desired. A specific use for the dispenser is for supplying wetting agent to an automatic



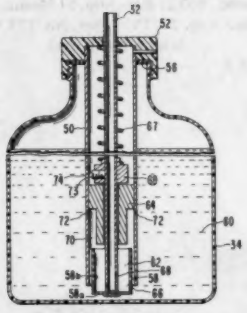
dishwasher at a selected time in the dishwashing cycle to aid in cleaning dishes.

3,749,289

LIQUID TONER CONCENTRATE DISPENSER FOR AN ELECTROPHOTOGRAPHIC DEVELOPING SYSTEM

Raymond Leon Levy, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed July 6, 1971, Ser. No. 159,915
Int. Cl. G01f *11/02*
U.S. Cl. 222—321 **7 Claims**



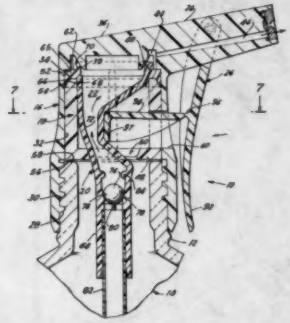
A valveless pump device is mounted on a threaded cap member and inserted into a toner concentrate flask which is then sealed by screwing down the cap. A reciprocating piston and housing type chamber extends from the cap and is immersed in toner concentrate. A hollow activating rod or tube extends into the flask through the cap and is affixed to the reciprocating piston. Up and down motion of the activating rod varies the capacity of the chamber and effects a two stroke pumping action involving a series of intake apertures and discharge ports located in the variable capacity chamber. During the first stroke the volume of the chamber decreases due to piston movement upward, and the liquid concentrate flows into the hollow center of the activating rod and upwards out of the flask into the electrophotographic developing apparatus. During the second stroke, the piston moves downward and the chamber expands to its original volume. Toner concentrate flows into the chamber through intake ports positioned in the side walls of the piston.

3,749,290

TRIGGER ACTUATED PUMP

Lewis A. Micallef, New York, N.Y., assignor to Leeds and Micallef, New York, N.Y.

Filed June 7, 1971, Ser. No. 150,417
Int. Cl. B67d *5/42*
U.S. Cl. 222—385 **20 Claims**



A manually actuated trigger pump is adapted to be fitted on the neck of a container for dispensing a liquid therefrom. The pump includes an outer tubular shell having lower internal threads for fittedly engaging the outer threads on the neck of the container. A laterally extending nozzle projects from the shell either as an integral part thereof or as a separate component having means for securely fastening the nozzle to the shell. A bulbous tubular member defining a pump chamber is disposed interiorly of the shell. The upper part of the tubular member is adapted to be secured to the outer shell and also includes a concentric rim engageable with surfaces of the shell in defining an upper outlet valve. The lower end of the flexible tubular member is of lesser diameter and provides an inlet valve seat for receiving a ball check valve. A dip tube is adapted to extend downwardly from the lower end of the tubular member for providing a passage therethrough into the pump chamber of the liquid contents of the container. A trigger mechanism adapted to be finger actuated extends through the shell and is adapted to engage the tubular member and collapse it for expelling the contents of the pump chamber. In this connection, the lower check valve will close the lower end of the pump chamber and the collapsing of the tubular bulb will cause its liquid contents to be expelled out through the upper valve and out of the outlet opening into the nozzle into the selected discharge spray pattern. Upon release of the trigger, the tubular bulb will return to its original fully distended position. During this transition the upper outlet valve will reseal and the lower ball check valve will be unseated to permit liquid from the interior of the container to be pulled upwardly through the dip tube into the pump chamber. This amount of liquid will be replaced by a corresponding amount of air which will be permitted egress into the container interior through the opening of an air inlet valve defined by the outer surfaces of the bulb and radially inwardly extending surfaces of the outer shell. When the bulb is fully distended, this air check valve will be closed and the lower check valve at the base of the tubular member will be reseated to close the valve chamber until the next pumping cycle.

3,749,291

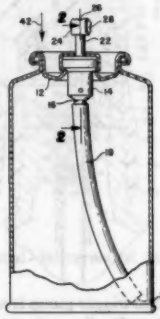
SELF-CLEANING SEQUENTIAL VALVE MEANS WITH BALL CHECK VALVE

Samuel Prussin, Los Angeles, and Jimmie L. Mason, Hacienda Heights, both of Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Oct. 2, 1968, Ser. No. 764,522
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.24 **1 Claim**

A sequential valve having a housing and a valve means reciprocally mounted therein, said valve means comprising

spaced peppet and ball check valve elements in the housing, such that said valve means may be forced into open position sequentially with respect to said spaced poppet and ball check valve elements in order that one fluid may flow around said poppet valve element after fluid is shut off with respect to flow around said ball check valve element to thereby provide for purging of said sequential valve at the end of each operating cycle thereof.



This invention relates to a self-cleaning sequentially operable valve adapted for dispensing fluids, and more particularly, to a fluids dispensing valve having series operable valve means adapted sequentially and concurrently to dispense a plurality of fluids through a common chamber and dispensing nozzle, and to cause automatic purging and cleaning of said chamber and nozzle by one of the fluids at the end of each valve operating cycle.

3,749,292

IRONING PRESS, IN PARTICULAR FOR JACKETS AND THE LIKE

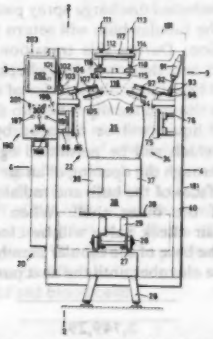
Wilhelm Engelbart, Seelscheid-Nackausen, Germany, assignor to Hoffman Rheem Maschinen GmbH, Cologne, Germany

Filed July 31, 1972, Ser. No. 276,543

Claims priority, application Germany, July 31, 1971, P 21 38 490.7

Int. Cl. D06c *15/00*

U.S. Cl. 223—57 **7 Claims**



An ironing press suitable for pressing outerwear garments is disclosed. A form-shaped body for carrying an item to be pressed is positioned on a rotatable support table which in turn is mounted on a carriage member movable between a garment mounting station and a pressing station. A plurality of press platens divided into at least two groups are provided. Each group is movable consecutively into pressing position against the shaped body with the individual platen members of each group having no mutual overlap with each other of the garment areas pressed by their ironing surfaces. The groups of platens each overlap in part the area covered by the remaining group so that the entire surface of the article is pressed.

3,749,293

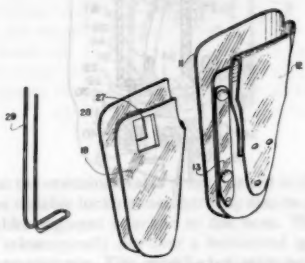
FRONT OPEN HOLSTER WITH LOW MOUNTING

John E. Bianchi, 1041 E. Green St., Suite 202, Bradbury, Calif.

Filed Dec. 27, 1971, Ser. No. 212,072

Int. Cl. F41c *33/02*

U.S. Cl. 224—2 B **2 Claims**



A holster of the type designed for removal of a revolver by forward movement of the hand on the grip whereby the revolver exits from the holster through a front slot. Disclosed is a belt loop assembly which is secured to the holster body at three points located near the barrel extremity of the revolver. The belt loop includes metal reinforcement including a step or offset whereby a slot exists between the holster body and the belt loop assembly throughout most of its length.

3,749,294

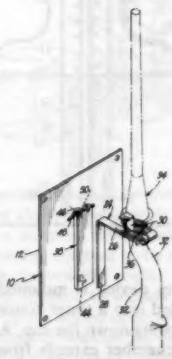
FISHING ROD HOLDER

Ralph D. Johnston, 10721 Ranchito, El Monte, Calif.

Filed Aug. 27, 1971, Ser. No. 175,504

Int. Cl. A45f *5/00*

U.S. Cl. 224—5 E **4 Claims**



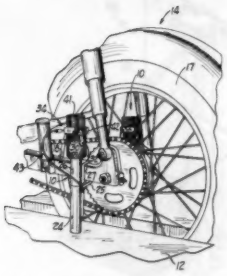
A fishing rod holder to be worn by a fisherman to permit him to hold a fishing rod in upright position with one hand and net a fish on the line with the other hand. The holder has a support member such as a plate to be secured against the wearer's midriff by a harness or the like which permits the fishing rod to swing fore and aft, and a rod mounting bracket removably and pivotally mounted on the plate to permit removal of the fishing rod from the holder and pivotal adjustment of the rod from side to side to locate the rod in front of either shoulder or in any angular position between the shoulders.

3,749,295

THEFT-PROOF LOCK-MEANS FOR SECURING A MOTORCYCLE TO THE VEHICLE CARRYING DECK OF A MOTOR COACH

Robert E. Palmer, 7100 Columbia Rd., 51 Brookins, Olmstead Falls, Ohio

Filed Dec. 13, 1971, Ser. No. 207,348
Int. Cl. B60r 9/10; E05b 71/00
U.S. Cl. 224—29 R 1 Claim



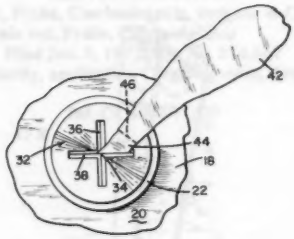
Clamp-means for securing a motorcycle to a platform by means of a padlock whose shackle is surrounded by case-hardened steel elements so shaped that the shackle cannot be reached by cutting sawing tools.

3,749,296

EXIT SLIT FOR BULK PACKAGE MOIST TOWELS OR TISSUES

Thomas S. Harrison, New Canaan, Conn., assignor to Sterling Drug Inc., New York, N.Y.

Filed July 10, 1972, Ser. No. 270,559
Int. Cl. B26f 3/00
U.S. Cl. 225—106 17 Claims



A new and improved exit slit for extracting a web from bulk moist tissue-like material from a container therefor, the tissue-like material being perforated at spaced intervals for severing at the slit as it is dispensed through the slit. The slit is substantially closed but has yielding edge portions imparting drag on the web to enable severing thereof into separate sheets as the web is pulled from the container, the slit being located at an angle with respect to the plane of the surface of the container in which the slit is located. This slit may be crossed or it may be single and straight; or a single V-shaped slit may be used.

3,749,297

ADJUSTABLE HOSE GUIDE

Darrell Andrew Williams, West Heidelberg; Adam Prus Wisinski, Parkdale, and David Gilbert Hay, Balaclava, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed July 31, 1972, Ser. No. 276,531
Claims priority, application Australia, Aug. 9, 1971, 5820
Int. Cl. B65h 23/28
U.S. Cl. 226—199 4 Claims

A guide device for a hose comprising a tube through which the hose may be slid, a means to adjust the inclination of the tube, a free standing mounting means and a means to adjust the height of the tube. The guide device is of use in inserting hoses filled with explosive slurry into narrow boreholes in underground mining operations.

ERRATUM

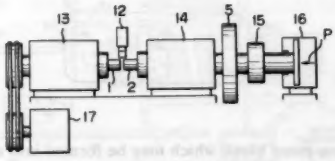
For Class 227—3 see:
Patent No. 3,750,117

3,749,298

APPARATUS FOR FRICTION WELDING

Atsushi Hasui, Tokyo, Japan, assignor to The Director of National Research Institute for Metals, Tokyo, Japan

Division of Ser. No. 748,825, July 30, 1968, Pat. No. 3,609,854. This application July 27, 1971, Ser. No. 166,408
Claims priority, application Japan, Aug. 5, 1967, 42/49977
Int. Cl. B23k 27/00
U.S. Cl. 228—2 1 Claim

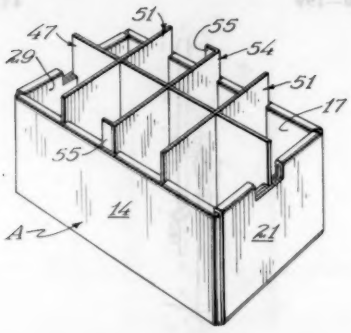


Apparatus is provided for welding workpieces in which a first workpiece is secured to a driven shaft and a second workpiece is secured to a freely rotatable shaft. The driven shaft is rotated at a constant speed. The surfaces of the two workpieces to be welded are engaged by an axial force to rotate the second workpiece and accelerate the rotation of the second workpiece to reach the rotational speed of the first workpiece, during which period a weld is completed. Simultaneously, the flash formed at the joint of workpieces during friction welding is removed.

3,749,299
COMPARTMENTED CONTAINERS

Robert B. Ingle, Fort Worth, Tex., assignor to Hoerner Waldorf Corporation, Ramsey, Minn.

Filed Oct. 26, 1971, Ser. No. 192,440
Int. Cl. B65l 5/48, 85/00
U.S. Cl. 229—15 4 Claims

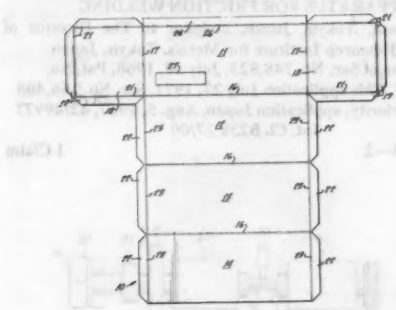


A partitioned container is provided in which the bottom wall and side walls are of double thickness and the end walls are of triple thickness the inner side walls and intermediate and inner end walls are vertically slotted to accommodate intersecting partition panels.

3,749,300
CARTON AND BLANK FOR FORMING CARTON

Charles Wright Jones, Los Angeles, Calif., assignor to Xepex Industries, Inc., Beverly Hills, Calif.

Filed May 3, 1971, Ser. No. 139,502
Int. Cl. B65d 5/16
U.S. Cl. 229—37 R 15 Claims

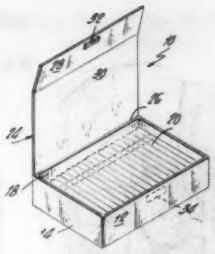


A one-piece blank which may be formed into a liquid-tight carton without the employment of a mandrel during the forming process is T-shaped and is comprised of side-wall panels integrally interconnected and numbering three or more to provide a carton of polygonal cross-section. One of the side wall panels has integrally connected carton end panels to be folded down upon and sealed to sealing flaps of the other side panels, after the side panels have been bent around into the configuration of an open ended tube and the ends of the blank thus brought together and adhesively interengaged to form a longitudinal seam. The end panels are also provided with sealing flaps which are folded down upon and sealed to the outside surfaces of the other side panels, thus providing internal and external liquid-tight seals.

3,749,301
MAGNETICALLY SEALABLE CONTAINER

George E. Peckar, 111 Cascade Rd., Stanford, Conn.

Filed May 15, 1972, Ser. No. 253,197
Int. Cl. B65d 5/34, 55/00
U.S. Cl. 229—44 R 7 Claims



An openable and selectively resealable container includes wall members defining an internal storage cavity and a flap member hingedly connected thereto and movable between an opened and closed position with at least a portion of the flap member being in overlying contact with one wall member of the container when the flap member is in its closed position. Magnetic sealing means are provided for retaining the flap member in its closed position and include a strip of permanent magnetic material secured to the flap member and located in a position to coact with and overlie a thin layer of ferromagnetic material which is secured to the one wall member. The one wall member is formed of a baseboard with at least one surface thereof being covered with a decorative, overwrap material after the ferromagnetic material is impressed into the surface of the baseboard to substantially conceal the appearance and location of the ferromagnetic material.

3,749,302
MAILBOX CONSTRUCTION

John W. White, 9 Fairhaven Rd., Mattapoisett, Mass.

Filed Feb. 21, 1972, Ser. No. 219,811
Int. Cl. A47g 29/12
U.S. Cl. 232—19 5 Claims

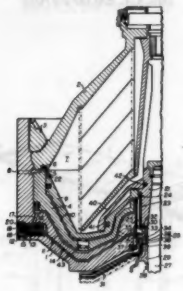
A mailbox construction that includes interiorly located baffles for directing articles of mail deposited in a mail slot to the interior of the mailbox, the forward and bottom walls being shaped and constructed to cause the deposited mail to be inclined forwardly and cooperating with the baffles to prevent unauthorized access to the mail articles as located within the interior of the mailbox.

3,749,303

CENTRIFUGAL SLUDGE SEPARATOR WITH DESLUDGING CONTROL MEANS

Heinrich Hemfort, Oelde, Germany, assignor to Westfalia Separator AG, Westfalia, Germany

Filed Apr. 30, 1971, Ser. No. 139,078
Claims priority, application Germany, May 6, 1970, P 20 22 198.1
Int. Cl. B04b *11/00*
U.S. Cl. 233—20 A 8 Claims



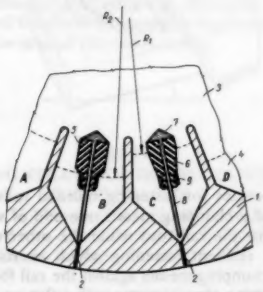
In a self-cleaning liquid-solids centrifugal separator having a drum wherein a piston is displaced periodically to expose a sludge discharge orifice through which sludge is discharged without stopping rotation of the drum, a second piston is provided. The second piston defines a chamber with the first piston which is filled with a control fluid. The second piston is displaced as the weight of sludge increases and when it moves a predetermined extent the flow of control fluid causes said first piston to move and expose said discharge opening. Displacement of the second piston can also set in operation a control mechanism which, either during each cycle or after a predetermined number of cycles, drains control fluid from the system and permits complete discharging of sludge from the drum even after the weight of sludge on the second piston is below the level at which it would otherwise cause the first piston to return to the position wherein the discharge orifice is closed.

3,749,304

METHOD OF AUTOMATIC CONTROL OF THE DISCHARGE OF A CONCENTRATED TRACTION OF SOLID PARTICLES DISPERSED IN LIQUIDS FROM A CENTRIFUGE ROTOR

Jan Putterlik, Praha, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed Jan. 3, 1972, Ser. No. 214,662
Claims priority, application Czechoslovakia, Jan. 18, 1971, 330
Int. Cl. B04b *11/00*
U.S. Cl. 233—47 R 4 Claims



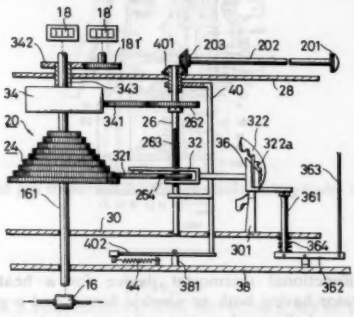
The control of discharge valves for the discharge of a concentrate from the circumference of a centrifuge rotor is achieved by application of an elastically yieldable body, elongated and shortened in accordance with the increasing and decreasing level of the concentrate in the circumferential part of the centrifuge body.

3,749,305

PRICE REGISTER FOR FLUID DISPENSING APPARATUS

Hiyoshi Tatsuno, 4-11, Shirogane 4-chome, Minato-ku, Tokyo, Japan

Filed Mar. 17, 1972, Ser. No. 235,747
Claims priority, application Japan, Mar. 22, 1971, 46/16356
Int. Cl. B67d *5/22*
U.S. Cl. 235—94 R 17 Claims



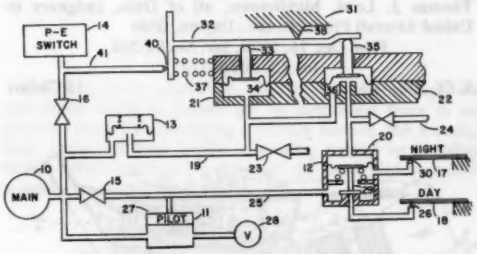
A price register for indicating the price of an amount of fluid being dispensed, comprising a calculating means which is selectively connectible to a gearing driven by an output shaft of a flow meter measuring the fluid being dispensed, through a transmission which converts the rotation of said output shaft at a ratio representing the unit volume price of the fluid. The register also includes a variator of unit volume price of the fluid.

3,749,306

DAY CYCLE RESTORATION MECHANISM

Richard C. Mott, Harwood Heights, and Milo R. Wentworth, Deerfield, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 29, 1971, Ser. No. 158,006
Int. Cl. G05d *23/185*
U.S. Cl. 236—47 10 Claims

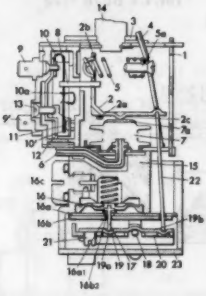


A mechanism for use in a day-night pneumatic thermostat for temporarily establishing day operation during a period when the thermostat is normally in night operation, the mechanism comprising manually operable lever movable to block the flow of fluid through a passageway connected to a relay which controls the flow of fluid to the day and night temperature responsive elements.

3,749,307
BIFUNCTIONAL THERMOSTAT DEVICE FOR A HEATING TYPE REFRIGERATOR HAVING BOTH AN ELECTRIC HEATER AND A GAS HEATER

Takeshi Odashima, Tokorozawa, and Takeo Makita, Sayama, both of Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Dec. 6, 1971, Ser. No. 204,999
Claims priority, application Japan, Dec. 9, 1970, 45/121926
Int. Cl. G05d 29/00
U.S. Cl. 236—48 6 Claims

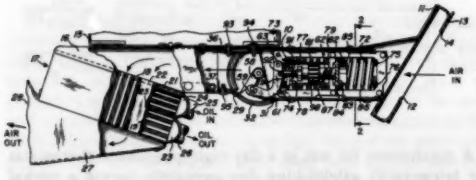


A bifunctional thermostat device for a heating type refrigerator having both an electric heater and a gas heater comprises a bellows whose internal pressure is controlled by a temperature sensitive member connected by a capillary tube to the bellows. A pivoted L-shaped lever has a first leg engageable with the movable outer end of the bellows and a second leg connected to operate a normally closed snap action switch controlling energization of an electric heater. The lever is biased in one direction by a spring connected to a cam follower having an end projecting outwardly and into engagement with a temperature setting cam. A diaphragm type valve controls the supply of gas to the gas heater and the diaphragm is spring biased to an open position. A pin secured to the diaphragm engages a lever assembly pivoted intermediate its ends, and a rigid rod is engaged between a free end of the lever assembly and the first arm of the L-shaped lever. When the internal pressure of the bellows decreases, due to a decrease in the refrigeration temperature, the L-shaped lever pivots to snap open the switch and to rotate the lever assembly to cause the pin to move the diaphragm toward a valve closing position.

3,749,308
BY-PASS CONTROL MECHANISM

Joseph F. Fernandes; Robert R. Pfouts, both of Dayton, and Thomas J. Lord, Middletown, all of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Oct. 16, 1970, Ser. No. 81,206
Int. Cl. F01p 7/12
U.S. Cl. 236—93 15 Claims

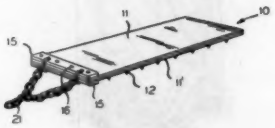


A by-pass mechanism including a door formed as a segment of a cylinder and mounted for swinging motion to alternate fluid flow control positions. A power element responsive to a changing condition of the controlled fluid is arranged for direct actuation of the door, with mechanical advantage. The door, and a mounting frame therefor, are constructed to impose minimal resistance to movement of the door in its travel to and from the alternate positions.

3,749,309
TRACTION PADS

Russell D. Becker, 1328 S. 96th St., West Allis, Wis.

Filed Jan. 18, 1971, Ser. No. 106,966
Int. Cl. E01b 23/00
U.S. Cl. 238—14 1 Claim

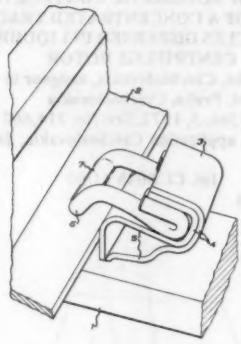


Two traction pads are formed with lugs which bite into ice or snow. The pads are connected together by chains having a length such that the chains are taut when one pad is under a front wheel of an auto and the other pad is under the rear wheel of the auto. This way, the weight of the car on the front pad keeps the traction force of the rear wheels from flinging the traction pad out from under the wheels and behind the car.

3,749,310
SPRING-LOADED CLAMPING DEVICES FOR FASTENING RAILROAD RAILS

Alf Lennart Borup, Bromma, and Karl Rune Hamrin, Lesjofors, both of Sweden, assignors to Lesjofors AB, Lesjofors, Sweden

Filed June 11, 1971, Ser. No. 152,154
Int. Cl. E01b 9/02
U.S. Cl. 238—349 3 Claims



Clamping devices for fastening railroad rails to a support with the aid of a clamping means one end of which exerts a pressure against the rail foot while the other end thereof is disposed in a resilient fastening which exerts the pressure force via the clamping means against the rail foot, the fastening having a spring characteristic with a flat return curve provided by an extended spring travel stroke for at least one spring in the fastening.

3,749,311

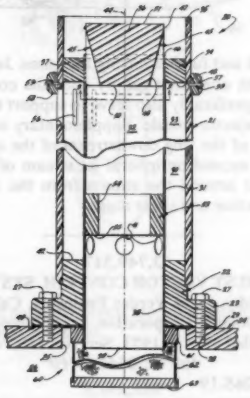
ORNAMENTAL FOUNTAIN WITH MULTI-TIER OR HORIZONTAL DISCHARGE PATTERNS

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.

Continuation-in-part of Ser. No. 102,757, Dec. 30, 1970, Pat. No. 3,690,554, which is a continuation-in-part of Ser. No. 32,333, April 27, 1970, abandoned, and a continuation-in-part of Ser. No. 78,117, Oct. 5, 1970, Pat. No. 3,645,449. This application Apr. 10, 1072, Ser. No. 242,663

Int. Cl. B05b *17/08*

U.S. Cl. 239—17 15 Claims



The present ornamental fountain nozzle comprises an elongate tubular body which defines therein an internal chamber having a water inlet opening at its lower end. A plug is fixedly disposed across the chamber at its upper end in spaced relation to the water inlet opening. Water outlet means are provided from the chamber to the exterior of the nozzle. The water outlet means comprise a plurality of water outlet holes defined through the body for discharging water radially laterally from the nozzle. The holes are defined between the water inlet opening and the plug at a location more proximate to the plug than to the water inlet opening. The holes are uniformly spaced along the body from the plug and are spaced regularly along the circumference of the body. An annular collar is circumferentially intimately engaged with the body proximate the holes for modulating the flow of water from the chamber through the holes. The effective flow area of the water inlet opening and of the water flow path between the inlet opening and the water outlet means is greater than the effective water flow area of the outlet means.

3,749,312

DRINKING STRAW FOR DOUBLE CONTRAST RADIOGRAPHY

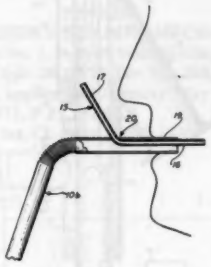
Norman Panzer, 71 Blanchard Rd., South Orange, N.J.

Filed Apr. 27, 1972, Ser. No. 247,998

Int. Cl. A47g *21/18*; A61j *15/00*

U.S. Cl. 239—33 5 Claims

The drinking straw has two tubes fixedly secured to each other so that one of the tubes, for gas, extends substantially further into the user's mouth than the other of the tubes, for barium sulphate in aqueous suspension; enabling the patient simultaneously to take into his gastro-intestinal tract both barium and gas to permit double contrast radiography of said tract.



3,749,313

DEVICE FOR MOISTENING MOVING SURFACES

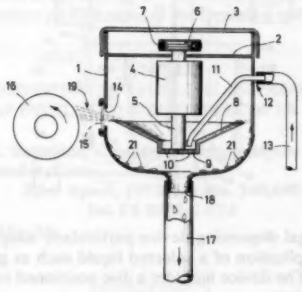
Heinz Weitmann, 7020 Leinfelden-2, Germany, assignor to Weitmann & Conrad, Echterdingen, Germany

Filed Nov. 26, 1971, Ser. No. 202,521

Claims priority, application Germany, Nov. 28, 1970, P 20 58 667.8

Int. Cl. B05b *3/02*

U.S. Cl. 239—127 15 Claims



A rotating body, preferably conically shaped, is supplied with liquid which is thrown off by centrifugal force in an atomized form for moistening a moving surface, the rotating body being confined within a housing having an opening therein which controls the shape of the pattern of atomized liquid dispensed.

3,749,314

LIQUID JET NOZZLE

Charles W. Robinson, San Francisco; Kenneth E. Merklin, Tiburon, and William P. Wood, San Francisco, all of Calif., assignors to Marcona Corporation, San Francisco, Calif.

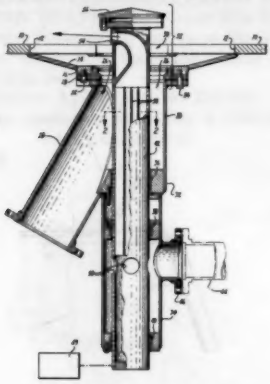
Filed Dec. 29, 1971, Ser. No. 213,363

Int. Cl. B05b *3/02*

U.S. Cl. 239—206 7 Claims

Liquid Jet Nozzle including nozzle head, input stem section with straightening vanes and an output nozzle orifice. Flow

pattern is re-entrant with respect to the input stream and is



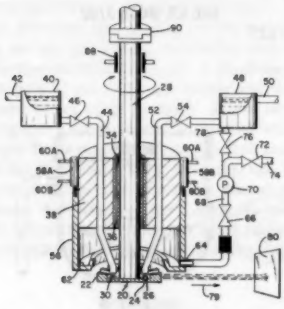
caused to change through a substantial angular direction and increase in velocity while maintaining minimum of turbulence.

3,749,315

CENTRIFUGAL DISPENSING DEVICE

Charles F. H. Crathern, Hopkinton, N.H., assignor to Crathern Engineering Company, Contoocook, N.H.

Filed June 23, 1972, Ser. No. 265,735
Int. Cl. B05b *3/10, 1/28*
U.S. Cl. 239—224 **9 Claims**



A centrifugal dispensing device particularly adapted to intermittent application of a selected liquid such as glue, paint and the like. The device includes a disc positioned to rotate in a horizontal plane.

Conduits are provided for feeding selectively supplies of the selected liquid and a solvent therefor to the disc. A shield is movably disposed so as to be selectively interposed between the disc and the work. Means are provided for moving the shield to a position between a work piece and the disc when solvent is applied to the disc, and for moving the shield away when the selected liquid is applied to the disc.

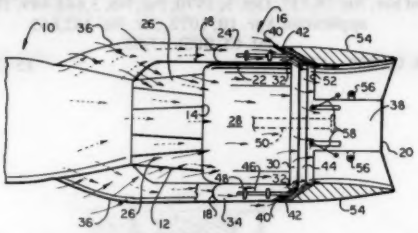
3,749,316

SOUND SUPPRESSING THRUST AUGMENTING APPARATUS

Remo Tontini, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed June 26, 1972, Ser. No. 266,156
Int. Cl. B64d *33/06;* **F01n** *1/14, 1/16*
U.S. Cl. 239—265.13 **10 Claims**

An aircraft jet engine is provided with an ejector nozzle which suppresses the jet noise and augments the thrust during takeoff and climb while also optimizing the thrust during cruise. The ejector nozzle is formed as a barrel or ring which is supported in operative position aft of the exhaust nozzle and defines, with the nozzle, inlet passage means for free stream air to enter and mix with exhaust gases in the mixing zone defined by the nozzle. Peripheral auxiliary jet nozzle means inside the ring eject a peripheral jet stream which surrounds and accompanies the mixed gases passing therethrough, adding to



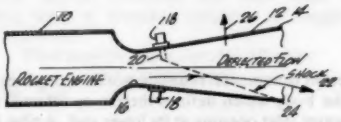
the total thrust and further mixing the gases. Jet nozzle means is supplied with energized gas by conduits connected to the engine, which preferably also serve to support the ring to form an integrated ejector nozzle. Supplementary nozzle means at the inner wall of the ring downstream of the auxiliary nozzle means eject a second peripheral jet stream of lower velocity free stream air around the stream from the auxiliary jet to reduce wall friction and shear noise.

3,749,317

THRUST VECTOR CONTROL SYSTEM

Irving B. Osofsky, Palos Verdes Peninsula, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Mar. 1, 1971, Ser. No. 119,747
Int. Cl. B64c *15/10*
U.S. Cl. 239—265.19 **2 Claims**



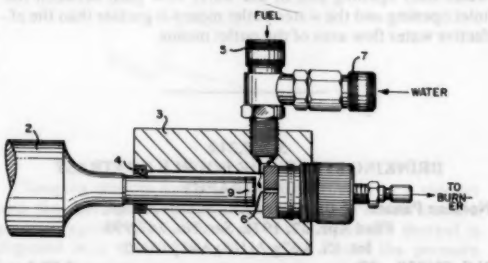
Deflection of a supersonic jet stream engine exhaust by a shock wave resulting from insertion of a small obstruction or a gas stream into the jet stream. This provides flight path deflection of the vehicle powered by the engine.

3,749,318

COMBUSTION METHOD AND APPARATUS BURNING AN INTIMATE EMULSION OF FUEL AND WATER

Eric C. Cottell, "Windermere", Bayville, Long Island, N.Y.

Filed Mar. 1, 1971, Ser. No. 122,632
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **4 Claims**



A combustion apparatus and process in which a water-in-oil emulsion of liquid fuel, such as liquid hydrocarbons, contain-

ing from 10 to 50 percent water, the emulsion being produced without any substantial emulsifying agent and preferably by sonic agitation, is burned.

3,749,319

APPARATUS FOR SPRAYING PLANTS

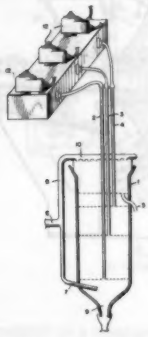
Adolf Fischer, 43 Speyerer Strasse, Mutterstadt, Germany

Filed Oct. 27, 1971, Ser. No. 193,116

Claims priority, application Germany, Nov. 4, 1970, P 20 54 222.7

Int. Cl. A62c *5/02*

U.S. Cl. 239—318 **9 Claims**



Apparatus for spraying plants having a liquid reservoir, suction tube and fixed overflow.

3,749,320

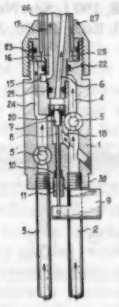
OXYGEN CUTTING AND WELDING TORCHES

Robert Marie Gerard Langer, Marly, and Paulette Aimee Babon, Saint-Maurice-sur-Moselle, both of France, assignors to Epsilon S.A., Marly, France

Filed July 11, 1972, Ser. No. 270,644

Int. Cl. B05b *7/12*

U.S. Cl. 239—416.1 **6 Claims**



The invention relates to improved oxygen cutting and welding torches of the kind comprising a head providing a heating mixture of oxygen and a fuel gas such as propane, natural gas or acetylene, and a jet of cutting oxygen, and a handle provided with two cocks for regulating the flow rate of the heating oxygen and the fuel gas, and a clapper-type control-valve for the cutting oxygen, the construction of said regulating cocks being simplified and rendered fluid-tight by making each cock of the direct-passage type comprising a body of synthetic material such as poly-tetrafluoro-ethylene, this body being mounted in a hole perpendicular to the gas conduit and arranged so as to close this conduit, and having a cylindrical central bore and two opposite lateral openings connecting this bore to the gas conduit, a packing gland being fixed in said hole on the body of synthetic material, and a needle-valve moving in the central bore and screwing into the packing gland so as to provide regulation for the hardness of operation of the regulating cocks.

3,749,321

FERTILIZER SPREADING MECHANISM

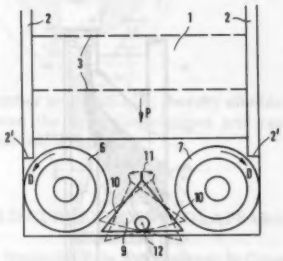
Josef Roiser, Haus No. 1, D-8949 Saulengrain, Germany

Filed Apr. 28, 1972, Ser. No. 248,544

Claims priority, application Germany, May 6, 1971, P 21 22 344.9; May 11, 1971, P 21 23 190.3

Int. Cl. A01c *17/00, 19/00*

U.S. Cl. 239—669 **9 Claims**



A fertilizer spreading mechanism in the rear portion of a vehicle body. A scraper belt on the floor of the vehicle conveys fertilizer in incremental steps towards a pair of helical rollers which are rotatably mounted on vertically disposed axes. The rollers spread the fertilizer conveyed to the rear of the vehicle by the scraper belt. The helical rollers are provided with a plurality of teeth on the edges thereof which disengage the fertilizer from the mass in the vehicle. The mechanism spreads the fertilizer alternately towards and away from each of the rollers by means of oscillating members located between and/or on both sides of the spreading rollers.

3,749,322

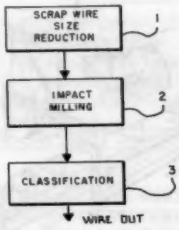
METHOD OF IMPACT MILLING AND ASPIRATING SCRAP INSULATED WIRE TO RECOVER METAL VALVES

Donald R. Reynolds, Cheshire, Conn., assignor to Entoleter, Inc., Hamden, Conn.

Filed Apr. 3, 1972, Ser. No. 240,648

Int. Cl. B07b *13/10*

U.S. Cl. 241—24 **11 Claims**



This process for recovering metal values from scrap wire involves a preliminary first screening and removal of magnetic portions. Then there is a second granulation and screening followed by centrifugal impact milling of the desired screened products. The milling products, i.e., the pieces of bare wire, the loose insulation, and the pieces of wire with insulation still on them are then aspirated to remove the free insulation. The aspirated residue is then screened, impact milled and

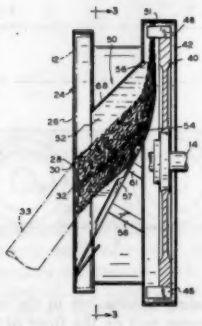
aspirated for a second time thereby extracting fine pieces of chopped bare copper or aluminum with an insignificant amount of insulation adhering thereto.

3,749,323

METHOD AND APPARATUS FOR FORMING PULPWOOD CHIPS

James L. Keating, Milwaukie, Oreg., assignor to Rader Companies, Inc., Portland, Oreg.

Filed Oct. 26, 1971, Ser. No. 192,037
Int. Cl. B27l *11/02*
U.S. Cl. 241—28 9 Claims



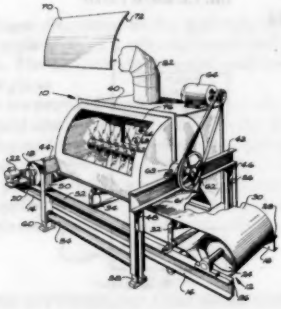
A wood chipper has a guiding tunnel from a rotating chipper disc to a fanwheel spaced from the disc for guiding chips into the path of blades of the fanwheel in substantial parallelism with the path of the blades and at a velocity not greatly different from that of the blades.

3,749,324

GARBAGE CLASSIFICATION SYSTEM

William P. Hyde, 7426 Mancini Ct., Dublin, Calif.

Filed Nov. 8, 1971, Ser. No. 196,365
Int. Cl. B02c *18/14*
U.S. Cl. 241—58 9 Claims



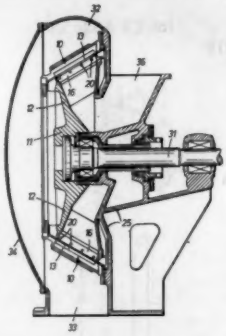
A garbage classification system separates lightweight refuse materials from heavier refuse materials as the refuse materials pass by on a conveyor. The lightweight refuse materials are picked up from the conveyor, shredded, and directed to a collection area for removal from the classifier.

3,749,325

WOOD CHIP CUTTING MACHINE

Gerhard Maier, 11 Fichtestrasse, 4812 Brackwede, Germany

Filed July 28, 1971, Ser. No. 166,873
Claims priority, application Germany, Aug. 21, 1970, P 70 31 361.0
Int. Cl. B02c *18/14*
U.S. Cl. 241—86 7 Claims



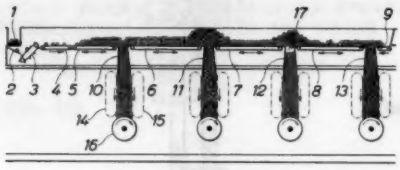
A wood chip cutting machine comprises a casing with a drum shaped cutter cage therein, the cage having a plurality of inwardly pointing cutters spaced around it. Cooperating with the cage is a rotor having arms each of which carries a thin double-edged blade. Each blade is replaceable, and is clamped on its rotor arm by a retaining strip held in place by bolts. The blade protrusion is only about equal to the blade thickness, which is preferably 2 mm.

3,749,326

DEVICE FOR DISTRIBUTING WOOD TO THE FEED CHUTES OF SHREDDERS

Erkki Aro, Hyvinkaa, Helsinki, Finland, assignor to Kone Osakeyhtio, Hyvinkaa, Finland

Filed Dec. 8, 1971, Ser. No. 206,105
Int. Cl. B02c *21/00, 23/02*
U.S. Cl. 241—136 8 Claims

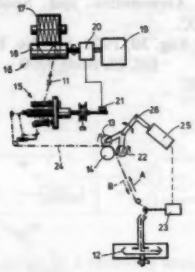


A device for distributing pieces of wood to the feed chutes of a plurality of consecutively placed wood shredders from a hauling track composed of a plurality of consecutively arranged belt, chain or rope conveyors, upon which the pieces of wood have been arranged, in transverse position, to be transferred from one conveyor to another for distribution to the feed chutes through intervals of the conveyors, which are continuously open and filled with wood. According to the invention the conveyors have, moreover, been arranged to start automatically at predetermined intervals in a direction opposite to the wood feeding direction for a period which is shorter than the running time in the feeding direction.

3,749,327
THREAD PACKAGING DEVICE WITH INTERMEDIATE THREAD STORAGE MEANS

Ernst Roethke, Schorndorf, and Hermann Guttler, Ebersbach, both of Germany, assignors to Zinser-Textilemaschinen Gesellschaft mit beschrankter Haftung, Postfach, Ebersbach, Germany

Filed Nov. 17, 1971, Ser. No. 199,441
Claims priority, application Germany, Nov. 17, 1970, P 20 56 593.9
Int. Cl. B65h *51/20*
U.S. Cl. 242—47.12 **16 Claims**



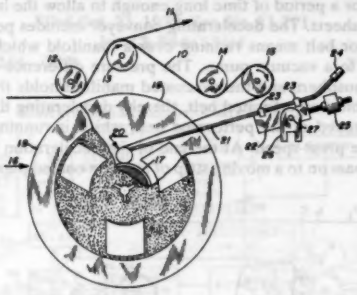
This invention relates to a machine for spinning thread and winding it into a package, there being an intermediate thread storage means between the spinning means and the winding means. The spinning means is of the known turbine type in which a thread is spun from a supply of individual textile fibers. The spun thread is continuously withdrawn from the turbine by a pair of rolls, one of which is driven, and fed to an intermediate thread storage means, capable of storing a substantial length of thread, from which the thread is drawn by the winding means at a normally slightly faster rate than it is fed to the storage means. There is a tension sensing means between the turbine and the feed rolls which operates, in the event of thread breakage, to reverse the feeding of the thread and move it back into the turbine to effect piecing-up. The intermediate storage means comprises a plurality of rollers freely rotatably mounted in a circle on a stationary disc and receiving a plurality of helical windings of the thread. The winding of the thread on the rollers is effected by a thread guide fixed to a rotatable and axially movable spindle coaxial with the circle of rollers. The spindle is biased in the winding direction by a weight operatively secured thereto, and in the unwinding direction by the package winding means which is normally driven at a uniform speed, but which can be driven at a lesser speed depending on the axial position of said spindle. The winding means comprises a drum which tangentially engages and frictionally drives the package being wound. Said drum is driven by a constant speed motor through a clutch, friction or jaw, which may be intermittently engaged, or by variable speed planetary gearing, whereby the winding speed may be reduced in the event that the amount of thread on the storage device falls below a predetermined amount. This reduction in speed is effected by an electric switch controlled by the axial position of the spindle whereby the amount of thread on the storage device is maintained within substantially fixed limits.

3,749,328
APPARATUS FOR WINDING THIN FILM INTO A ROLL

John F. Dusenbery, 157 Christopher St., Montclair, N.J.

Filed Feb. 7, 1972, Ser. No. 224,092
Int. Cl. B65h *23/24, 27/00*
U.S. Cl. 242—67.1 **4 Claims**

An air-permeable member is secured to the end of a tube carried by a pivotally-mounted guide arm, said member being positioned between the flanges of a tape reel and mechanically biased toward the reel hub as a strip of tape is wound onto the hub. The tube is connected to a source of air under pressure and the tape passes around a peripheral surface of the air-

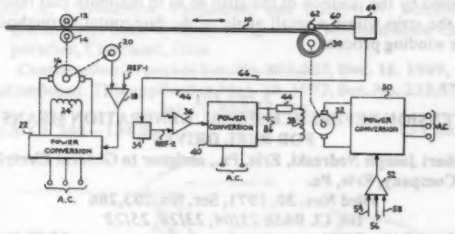


permeable member and onto hub, thereby eliminating air occlusions between the tape convolutions and resulting in a smoothly wound roll of tape.

3,749,329
STATIC FIELD CURRENT CONTROL APPARATUS FOR REEL DRIVES

Robert Joseph Nedreski, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Nov. 30, 1971, Ser. No. 203,284
Int. Cl. B65h *25/04, 23/20, 25/22*
U.S. Cl. 242—75.51 **8 Claims**



Static circuit means is provided for controlling the field current of a d-c reel drive motor in response to an input signal proportional to the diameter of strip material on a reel, the field current varying non-linearly with respect to the reel diameter in accordance with:

$$F = D/A + BD$$

where F is proportional to the magnitude of the field current, D is the magnitude of the diameter signal, and A and B are constants established in accordance with the saturation characteristics of the d-c motor such that the field strength resulting from the field current varies linearly with respect to the reel diameter.

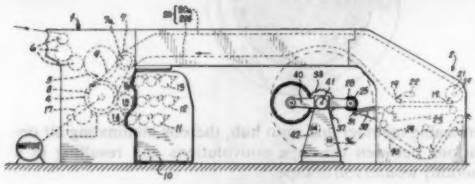
3,749,330
APPARATUS FOR DELIVERING SHEETS ONTO A MOVING STRIP OF MATERIAL

Ivaldo Gazzola, Lausanne, Switzerland; Salvatore F. D'Amato, Floral Park, and Ghauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,364
Int. Cl. B65h *39/14*
U.S. Cl. 242—67.3 R **14 Claims**

This sheet delivery apparatus for use with an intaglio printing press takes sheets from a conventional conveyor running at press speed, and on which the sheets are widely spaced as

determined by the press operation, and passes them along a decelerating conveyor to a continuously running strip on which they are deposited in closely spaced relation. The strip and sheets together are then wound into a roll and allowed to stand for a period of time long enough to allow the ink to dry on the sheets. The decelerating conveyor includes perforated conveyor belt means running over a manifold which is connected to a vacuum pump. The pressure difference between the atmosphere and the evacuated manifold holds the sheets lightly on the perforated belt, thereby decelerating the sheets to the speed of the perforated belt, which is running slower than the press speed. At the end of the deceleration belt, the sheets pass on to a moving strip of paraffin coated paper which



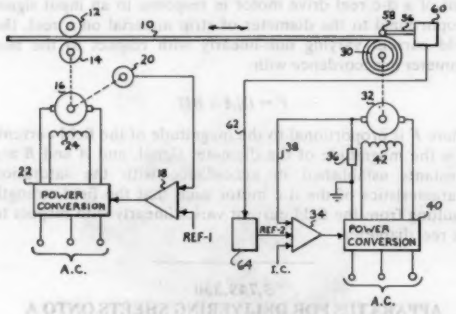
is being driven at a predetermined ratio with respect to the press speed by means of a continuous belt drive which runs along with the strip for a substantial distance. The tension on this strip is controlled by driving the strip take-up reel with a motor having a limited maximum torque characteristic, driving the strip between the reels at a preselected speed, and braking the strip supply reel with a limited maximum torque brake. The sheets pass from the decelerating belt onto a reach of the strip which is inclined slightly downward and extends to a reel on a double reel stand. The take-up reel position is controlled by the position of the strip so as to maintain that reach of the strip within a small angle of the horizontal throughout the winding process.

3,749,331

TENSION REFERENCE SIGNAL GENERATION MEANS FOR REEL DRIVES

Robert Joseph Nedreski, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Nov. 30, 1971, Ser. No. 203,286
Int. Cl. B65h *25/04, 23/20, 25/22*
U.S. Cl. 242—75.51 **12 Claims**



Static circuit means is provided for generating a tension reference signal in response to an input signal proportional to the diameter of strip material on a reel, the tension reference signal having a magnitude defined by $T = A + BD$ where T is the magnitude of the reference signal, D is the magnitude of the diameter signal, and A and B are constants having an interrelationhip defined by $B = R - RA/10$ where R is the build-up ratio of the reel, the build-up ratio being the ratio of the maximum (full) reel diameter to the minimum (empty) reel diameter.

ERRATUM

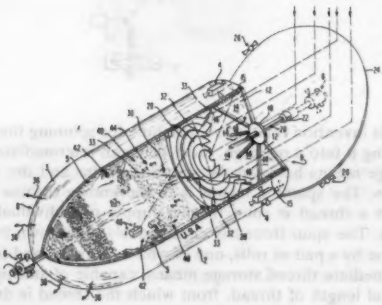
For Class 242—198 see:
Patent No. 3,748,988

3,749,332

SPACE VEHICLE WITH ARTIFICIAL GRAVITY AND EARTH-LIKE ENVIRONMENT

Vernon H. Gray, Bay Village, Ohio, assignor to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 30, 1971, Ser. No. 175,983
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SC **10 Claims**

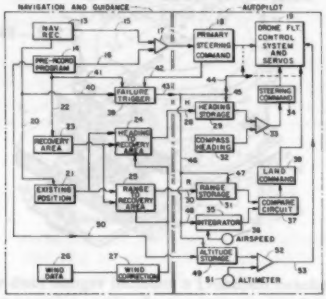


A space vehicle adapted to provide an artificial gravity and earthlike atmospheric environment for occupants is disclosed. The vehicle comprises a cylindrically-shaped, hollow pressure-tight body one end of which is tapered from the largest diameter of the body, the other end being flat and transparent to sunlight. The vehicle is provided with thrust means which rotates the body about its longitudinal axis, generating an artificial gravity effect upon the interior walls of the body due to centrifugal forces. Sunlight is directed into the interior of the body through the transparent end by means of a mirror which is oriented independently of the rotation of the body. The sunlight is dispersed to the internal surfaces of the body by means of a structure of concentric reflecting and deflecting rings. The walls of the tapered end of the body are maintained at a temperature below the dew point of water vapor in the body and lower than the temperature near the transparent end of the body. Due to the temperature differential between the two ends and rotation of the body, warm air and water vapor flow from near the transparent end towards the longitudinal axis of the body and towards the tapered end. The water vapor condenses on the walls of the tapered end and due to centrifugal force flows back towards the transparent end along the walls of the body. The cooled air flows back towards the transparent end adjacent the walls of the body. The walls of the body are lined with soil and provided with an initial supply of plants and livestock. Because of the controlled climate and sunlight, an earthlike environment is maintained wherein the carbon dioxide/oxygen balance is maintained, and food for the travelers is supplied through natural system of plant life which can be maintained in the spacecraft. Waste products are treated hygienically and returned to the soil to serve as fertilizers. A pleasant earthlike environment is provided for space travelers on voyages of years or possibly decades in duration.

3,749,333
DEAD RECKONING BACK-UP NAVIGATIONAL SYSTEM FOR A DRONE

Lowell O. Lykken, Westlake Village, and Erwin E. Schulze, Jr., Placentia, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed June 15, 1972, Ser. No. 263,155
Int. Cl. F42b 15/10, 15/02, 15/32
U.S. Cl. 244—3.15 4 Claims

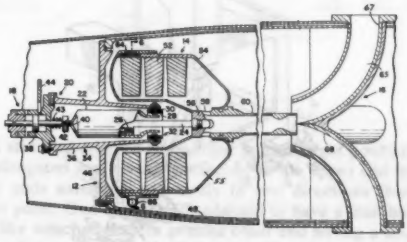


The heading and range to a recovery area for a drone on a mission are continuously monitored and stored on board the drone. Any failure in the primary navigational system in the drone is detected and the stored heading and stored range are available for comparison with the on-board compass reading of the drone and an on-board air speed integrator for the drone. Any deviation between the drone compass reading and the stored heading is corrected by generation of an error signal to operate the flight controls of the auto-pilot on the drone to steer the drone towards the recovery area. A landing command signal, in turn, is provided only when the integrated air speed equals the stored range. Corrections for wind conditions are automatically included in the stored heading and range information so that accurate dead reckoning back to the recovery area is realizable. A wholly self-contained means is thus provided for returning a drone to a specified recovery area in the event of failure of its primary navigational system at any point in time during its mission.

3,749,334
ATTITUDE COMPENSATING MISSILE SYSTEM

William C. McCorkle, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1966, Ser. No. 540,479
Int. Cl. F42b 15/02
U.S. Cl. 244—3.22 16 Claims

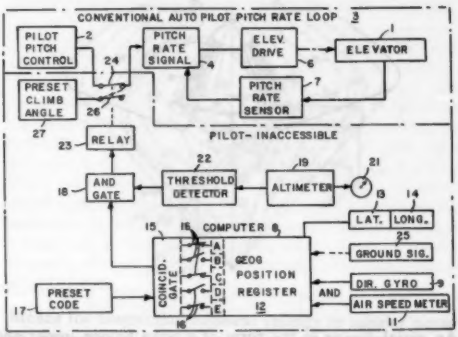


A missile utilizing directional control guidance concepts in which torques proportional to missile attitude are generated to correct attitude of the missile during its flight to impact at a target.

3,749,335
AUTOPILOT SYSTEM CONTROLLING ENTRY OF A CRAFT INTO FORBIDDEN ZONES

Thurston V. Williams, c/o The O. K. Tool Co., Inc., Milford, N.H.

Filed Oct. 23, 1970, Ser. No. 83,271
Int. Cl. B64c 13/18
U.S. Cl. 244—77 B 2 Claims

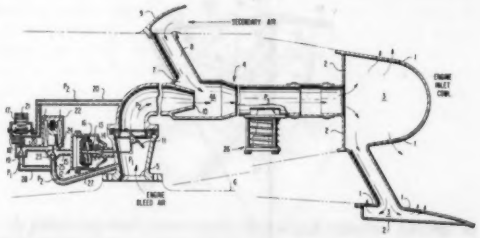


In combination with the autopilot system of an aircraft an onboard control system inaccessible to the pilot responds to ground transmitted or onboard computed geographical position signals to restrict pilot heading or descent maneuvers when the aircraft enters a forbidden geographical zone.

3,749,336
AIRCRAFT ANTI-ICING APPARATUS

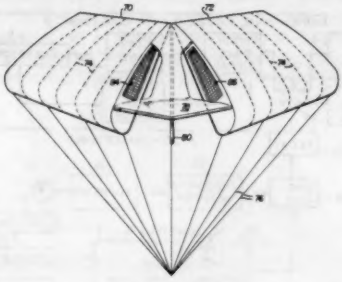
Eric A. Christensen, Columbus, and Robert W. Schilling, Grove City, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 885,503, Dec. 16, 1969, abandoned. This application Mar. 10, 1972, Ser. No. 233,573
Int. Cl. B64d 15/04
U.S. Cl. 244—134 B 13 Claims



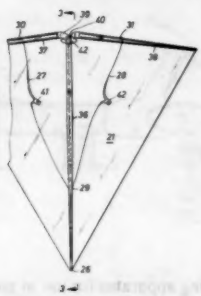
Anti-icing/de-icing apparatus for use in aircraft, comprising apertured fairings constructed from aluminum or alloys thereof defining air spaces therewithin, and means for delivering temperature controlled warm air under pressure to said air spaces, which means includes a conduit for conveying engine bleed air to said air spaces, an inlet to the conduit for cool ambient air to be mixed with the relatively warm engine bleed air, an anti-icing valve interposed in the conduit between the engine bleed air intake and the ambient air inlet and control means for regulating the valve to maintain the pressure and temperature of the air delivered to the air spaces below predetermined nominal values, said control means including pressure-responsive means and manually-controlled electrical means for overriding the pressure-responsive means. Additionally, the present invention contemplates an emergency relief valve disposed in the conduit downstream of the ambient air inlet and adapted to open in the event that the pressure or temperature of the air passing thereby is of greater than a predetermined maximum value.

3,749,337
AERIAL SLED
Domina C. Jalbert, 170 N.W. 20th St., Boca Raton, Fla.
Continuation-in-part of Ser. No. 867,116, Sept. 30, 1969, abandoned. This application May 27, 1970, Ser. No. 41,022
Int. Cl. B64d 17/04
U.S. Cl. 244—145 4 Claims



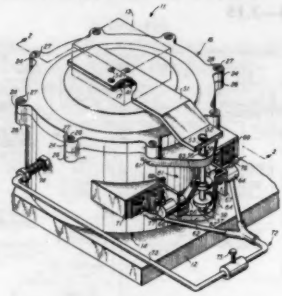
An aerial device in the form of a wing having upper and lower flexible layers and a leading edge and a trailing edge, a wall of the wing having an opening facing outward from the bottom or a side of the wing forming an inlet for flow of pressurized air into the wing, and a normally open flexible valve for the opening closeable by the air pressure to seal the opening when pressurized air is admitted to the wing.

3,749,338
KITE ASSEMBLY
Ernest V. Kinsey, 9110 Larston, Houston, Tex.
Filed Aug. 4, 1971, Ser. No. 168,911
Int. Cl. B64c 31/06
U.S. Cl. 244—153 R 8 Claims



This disclosure relates to kite assemblies and constructions which employ high-strength structural members. The kite assembly consists of a vertical or longitudinally extending frame member which at one end is pivotally connected to transverse or side frame members. A kite cover is attached to each of the frame members along its length. The shape of the kite is that of a "T" with the transverse frame members forming the upper edges of the kite. The T-shape enhances the kite's maneuverability and increases its ruggedness. The pivotal connection of the transverse members to the vertical member permits the collapsing of the assembly so that the transverse members can be brought into substantial parallel alignment with the longitudinal member and the assembly rolled into a tube configuration. The bridle lines are also attached to the assembly. Thus, the kite is an integral snap open or shut unit with no assembly required.

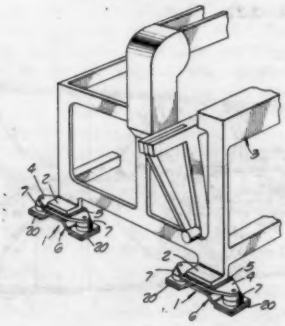
3,749,339
VIBRATION ISOLATOR MOUNT
Michael K. Avedissian, Mohnton, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Oct. 12, 1971, Ser. No. 188,207
Int. Cl. F16f 15/08, 11/00
U.S. Cl. 248—20 7 Claims



A vibration isolator mount includes a pair of concentric chambers for confining a fluid medium such as air, with at least the inner chamber being interposed between a base and a load. The load is supported by a piston which is, in turn, supported for vertical movement by a flexible diaphragm affixed to an opening in the upper surface of the inner chamber. The chambers communicate through, and the volumes of air confined within the chambers are coupled by an orifice located in a wall common to both chambers.

When the base or the load is subjected to vibrational displacements, the confined fluid contracts and expands at a very slow rate to store and release vibratory energy and thereby isolate the load from the base. Also, the orifice damps the passage of air between the chambers, dissipating vibratory energy as heat. The load is maintained at a preset equilibrium height by a pair of valves which compensate for changes in the weight of the load by admitting air to or exhausting air from the chambers.

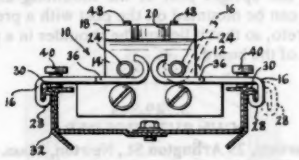
3,749,340
MOUNTING ASSEMBLY FOR LOOMS AND THE LIKE
Arthur Williams, and Donald Ray Davenport, both of Greenville, S.C., assignors to Richen Inc., Greenville, S.C.
Filed Oct. 19, 1970, Ser. No. 81,931
Int. Cl. F16f 15/00
U.S. Cl. 248—24 12 Claims



An assembly is disclosed for mounting and supporting looms and other machines in which vibration produced during operation is controlled. The assembly includes a first plate

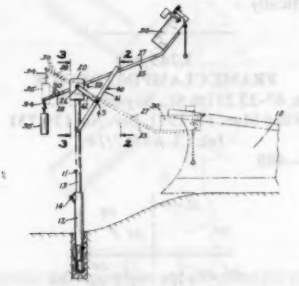
which is adapted to support the foot of the loom on one surface and a second plate which is attached to and supports the first plate. Resilient means such as a grommet are positioned between and interconnect the first and second plates.

3,749,341
BUS DUCT HANGER ASSEMBLY
John A. Swessel, Jr., Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Mar. 31, 1972, Ser. No. 240,036
Int. Cl. F16l 3/12
U.S. Cl. 248—59 5 Claims



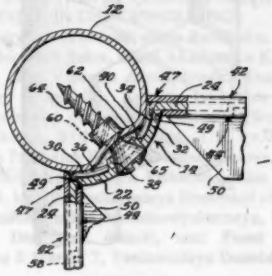
The bus duct hanger includes a L-shaped bracket having a vertical leg carrying a pair of oppositely disposed and laterally extending clamping members and a horizontal leg having a slotted opening receiving the lower end of a drop rod. Each clamping member has a downturned hook portion at the outer end which is adapted to receive and carry a respective outturned flange located on opposite sides of the bus duct. Each clamping member is secured to the duct housing by a screw which is tightened into engagement with the housing to draw the hook portion securely upwardly around the respective duct flange. A washer, interposed upper and lower jam nuts which are threaded onto the lower end of the drop rods, abuts a pair of upstanding nibs located on the bracket slot to prevent the hanger from falling off the end of the drop rod prior to the tightening of the jam nuts to secure the hanger to the drop rod.

3,749,342
MOUNTING APPARATUS FOR MAIL BOXES AND THE LIKE
Nathan L. Perrine, Rugby, N. Dak.
Filed June 2, 1970, Ser. No. 42,771
Int. Cl. F16m 13/00
U.S. Cl. 248—123 1 Claim



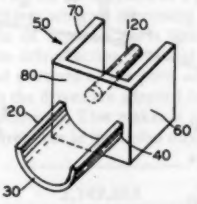
A standard adapted to be fixed in an upright position with an elongated arm pivotally attached to the upper end thereof with ends extending outwardly in two directions from the pivot point. One of said ends adapted to have a mail box and the like attached thereto and the other end having a counterbalancing weight attached thereto. The arm is guided for movements between a first position wherein the mail box is in a mail receiving position and a second position wherein the mail box is rotated substantial distance above the first position. The weight is oriented so that the mail box will remain in either of the two positions.

3,749,343
MEANS FOR CONNECTING ADJACENT RAILINGS TO A POST TO FORM A SUPPORT FOR FORMING A BOOKCASE, SHELVING, OR THE LIKE
Howard J. Marschak, 865 W. North Ave., Evanston, Ill.
Filed Oct. 15, 1971, Ser. No. 189,534
Int. Cl. F16m 11/16
U.S. Cl. 248—188 6 Claims



Means for connecting adjacent railings to tubular posts to form supports for shelving or the like, which includes corner brackets, each bracket having an intermediate curvilinear or arcuate-shaped section and oppositely extending ends, which ends are positioned at substantially right angles to each other and with side and end railings secured to the ends of the corner brackets and with the curvilinear section of the corner brackets positioned adjacent the tubular post and connected thereto.

3,749,344
JUMP CUP
Joseph M. Racina, 450 Kings Hwy. East, Middletown, N.J.
Filed Oct. 12, 1971, Ser. No. 188,204
Int. Cl. A63k 3/04
U.S. Cl. 248—221 2 Claims

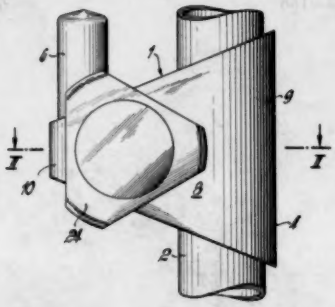


A jump cup includes a semi-cylindrical member having, as an integral portion, a bracket for engaging a support post and a pin for entering a hole in the support post whereby the jump cup is held securely in place. Two jump cups coupled to spaced-apart support posts can support a cross bar between them, over which a horse or a man can jump.

3,749,345
ROD SUPPORTED SHOWER SLIDE WITH ECCENTRIC CLAMP
Ernst Luder, and Gunter Buzzi, both of Schiltach, Black Forest, Germany, assignors to Firma Hans Grohe KG., Schiltach, Germany
Filed July 16, 1971, Ser. No. 163,266
Claims priority, application Germany, July 17, 1970, G 70 26 951.1
Int. Cl. F16b 21/12
U.S. Cl. 248—230 9 Claims

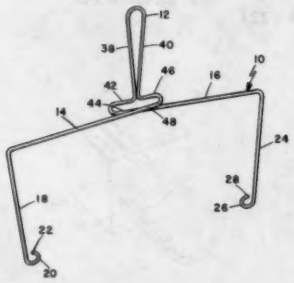
A rod supported shower slide includes a sliding body having a bore at one side for engagement around a rod on which it is

slidable and a bore at an opposite end which is provided for a shower-spray holding pin. A blind bore extends substantially perpendicular to the bore for the rod and in this bore is rotatably supported a pin which carries an eccentric having a curvature corresponding to the curvature of the rod upon which the device is engaged. The pin may be rotated to cause



the eccentric to engage in holding engagement with the rod. The slide body has a form of approximately an isosceles trapezoid. The side faces on each side are planar and they taper conically toward each other from one side at the large diameter bore for receiving the rod to the other side to the small diameter bore for receiving the holding pin, and each side end is rounded.

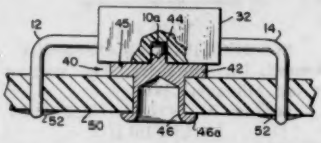
3,749,346
SADDLE CLIP FOR HANGING LIGHT FIXTURES
Victor B. Cherniak, 1057 Madison Ave., Chula Vista, Calif.
Filed Oct. 14, 1971, Ser. No. 189,307
Int. Cl. F16b *1/00*
U.S. Cl. 248—302 **4 Claims**



A saddle clip for hanging the channel box type of fixture used for fluorescent lights, formed from a single piece of wire and adapted for installation without tools. The clip has resilient legs which hook under and grip the edges of a fixture and tend to tighten their grip under load. The upper portion of the clip is adaptable to standard support members for hanging the fixture.

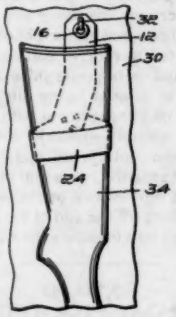
3,749,347
MOUNTING ELEMENT FOR ELECTRICAL COMPONENTS
Henry A. Schumer, Beverly Hills, Calif., assignor to Angstrohm Precision Incorporated, Van Nuys, Calif.
Filed Sept. 2, 1971, Ser. No. 177,375
Int. Cl. H05k *5/04*
U.S. Cl. 248—309 **18 Claims**

A mounting element for aligning an electrical component so that it is parallel with the plane of the circuit board (or chassis) on which it is contained. The mounting element includes a shank, an intermediate flat shoulder, and a post extending upright from the shoulder. The shank is inserted through a hole in the board and is fastened to the board so that the underside of the shoulder lies flat against the board. The com-



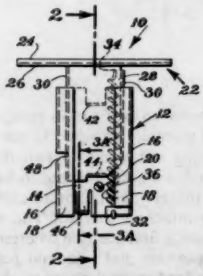
ponent to be mounted includes a bore in its underside which mates with the upright post of the mounting element. The component can be mounted on the post with a press-fit or cemented thereto, so that it lies on the shoulder in a plane parallel with that of the board.

3,749,348
GUN BUTT HOLDER
Curry M. Bartlett, 29 Arlington St., Newton, Mass.
Filed Mar. 8, 1972, Ser. No. 232,838
Int. Cl. F16m *13/00*
U.S. Cl. 248—359 **4 Claims**



A gun butt holder has a hanger member and a gripping member extending at an obtuse angle therefrom. The hanger member has an attaching member and the gripping member has provision to receive said attaching member to thereby so hold said gripping member around a gun butt, that the latter will hang vertically.

3,749,349
FRAME CLAMPING DEVICE
Louis Kaplan, 67-23 211th St., Bayside, N.Y.
Filed Mar. 31, 1971, Ser. No. 129,731
Int. Cl. A47l *7/14*
U.S. Cl. 248—488 **2 Claims**



A bracket that is secured to a wall, and a clamp that is relatively movable with respect to the bracket, provide means for

releasably holding an article such as a frame, picture, sign, or the like. Means are included for urging the clamp into engagement with the top of the article. Means are also included for locking the device when it is disengaged from the article as well as means for locking the device when it is in contact and engaged with the article.

3,749,350

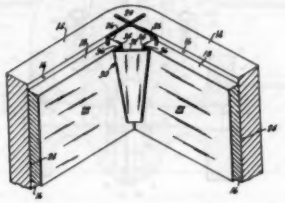
CLIP MEANS FOR HOLDING INSERTS IN MOLDS

Donald C. Atkinson, Ellwood City, Pa., assignor to Universal Refractories Corporation, Milwaukee, Wis.

Filed July 29, 1971, Ser. No. 167,202

Int. Cl. B22d 7/10

U.S. Cl. 249—106 **8 Claims**



A hot top assembly for an ingot mold, the assembly including a number of side boards suspended from the top of the ingot mold downwardly along the inside surfaces of the mold, each of the side boards having downwardly and outwardly inclined edges and a clip having V-shaped end walls which are adapted to matingly engage the inner corners of adjacent edges of the side boards, the clip on being forced downwardly provides an outward bias to the suspended side boards.

3,749,351

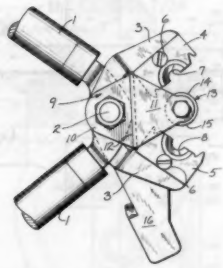
BULLET MOLD WITH PIVOTALLY MOUNTED CENTRAL MOLD PORTION

Richard J. Lee, R. R. 2, Hartford, Wis.

Continuation-in-part of Ser. No. 168,569, Aug. 3, 1971. This application Dec. 29, 1971, Ser. No. 213,635

Int. Cl. B41b 11/54

U.S. Cl. 249—170 **3 Claims**



A pair of outer mold portions are mounted for relative arcuate pivoting movement, about a pivot center, into and out of closed molding position. The outer mold portions are provided with female cavity portions. An inner mold portion is disposed between the outer mold portions and mounted for arcuate pivoting movement about the same pivot center. In one embodiment, as where hollow bullet portions are desired, the inner mold portion comprises a male core which cooperates with the said female cavity portions. In another embodiment, the inner mold portion comprises a member providing a pair of female cavity portions which register with the cavity portions in the outer mold portions to provide casting of two bullets at one time. In both embodiments, two or more bullets can be cast by using appropriate multi-cavity structures. In all embodiments, a Z-shaped holder for the inner mold portion has a web with end edges which automatically engage the side walls of the respective outer mold portions to provide an automatic stop for centering the inner mold portion when the mold is opened.

3,749,352

DEVICE FOR ERECTION OF PRESSED MONOLITHIC LINING IN UNDERWORKINGS

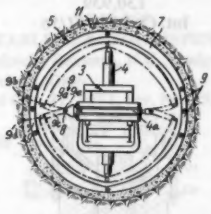
Vladimir Alexandrovich Khodosh, ulitsa Burdenko, 16/12, kv. 16; Sergei Fedorovich Salov, ulitsa Akademika Koroleva, 9, korpus 2, kv. 284; Valentin Alexandrovich Ivanov, ulitsa Konstantinova, 4, kv. 25; Arkady Ivanovich Mozhaev, Khavsko-Shabolovsky pereulok, II, kv. 446; Evstafya Andreevich Vasilenko, Rizhsky proezd, 1/5, kv. 50, all of Moscow; Budu Pavlovich Pachulia, ulitsa Paulova, 8-a, kv. 4, Ibilisi; Iosif David-Yankelevich Fishman, ulitsa Mashinostroitelnaya, 13, kv. 20, Yasinovataya Donetskoi oblasti; Ivan Iosifovich Melnikov, ulitsa Mashinostroitelnaya, 15, kv. 20, Yasinovataya Donetskoi oblasti, and Faust Ivanovich Rusanov, ulitsa 8 Marta, 7, Yasinovataya Donetskoi oblasti, all of U.S.S.R.

Filed Jan. 13, 1971, Ser. No. 106,015

Claims priority, application U.S.S.R., Jan. 19, 1970, 1,396,644

Int. Cl. B28b 7/30

U.S. Cl. 249—180 **1 Claim**



A collapsible device for the erection of a pressed monolithic lining in underworkings wherein a pressing member, along its perimeter, is made of separate parts linked through hinge joints connected to drives acting in radial directions, and in which case the end portions of the parts adjoining the hinge-joints connected to the drives are adapted for rotation or function as toggle mechanisms. This makes it possible to develop an adequate pressure force in the radial directions.

3,749,353

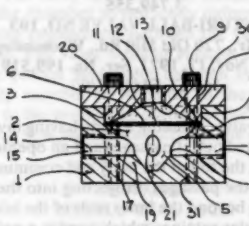
MEMBRANE SHUTOFF VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio

Filed June 24, 1971, Ser. No. 156,431

Int. Cl. F16k 7/12

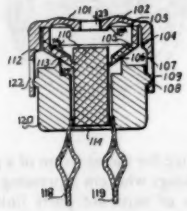
U.S. Cl. 251—61.1 **3 Claims**



A membrane operated, pilot actuated, normally open two way shutoff valve having a pilot cap permanently secured to the valve housing, and a membrane separating piloting section

from the valving section and held securely by a pilot cap at it's periphery while the central portion is allowed to stretch under pilot pressure and to close fluid valving passages inside valve housing when controlling flows of any fluid requiring straight through flow passages with minimum pressure drop, including positive support for stretched membrane inside valve housing which is provided with appropriate seat of conical configuration to permit membrane elastic deformation within confines of such housing cone and not more, and thus drastically changing the operation and life span of similar valves with unsupported elastomers as found in most diaphragm valves, with membrane providing simplicity and operational improvements, and the Memrane Shutoff Valve permitting flexibility in use no other designs can provide,such as multiporting valve housing for single fluid inlet port and multiple outlet ports running radially into the conical housing chamber or even being converted to a positive displacement pump by an addition of appropriate check valves into the valve ports, and flexibility in selecting seal and valve body materials compatible with corrosive fluids valved while the pilot cap may remain the same.

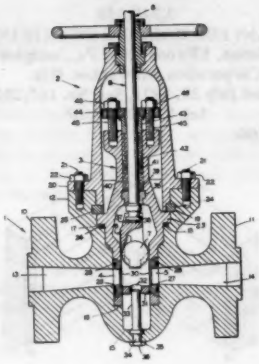
3,749,354
SNAP MECHANISM FOR USE IN ELECTRICAL SWITCHES, FLUIDIC SWITCHES, VALVES, ETC.
Eli Raitport, 1807 Mower St., Philadelphia, Pa.
Continuation-in-part of Ser. No. 821,547, April 18, 1969, Pat. No. 3,609,266. This application Apr. 5, 1971, Ser. No. 130,939
Int. Cl. F16k *31/56*
U.S. Cl. 251—75 **12 Claims**



This invention deals with a push-push snap mechanism in an electrical switch, in a valve and other applications snap mechanism consisting of a stem and a resilient cup, with two related positions. The stem carries the moving contacts, which are bridging stationary contacts. The junction lines of stem with bottom of cup and of bottom of cup with walls of cup are undercut and form hinges. The valve stem carries flexible lips which seal the valve preventing fluid leakage, and also seals the valve ports until the snap occurs (when so programmed).

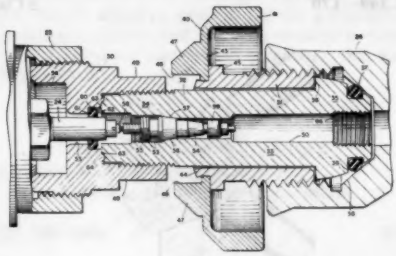
3,749,355
VENTURI-BALL VALVE NO. 103
Herman L. Paul, Jr., 720 Old Mill Rd., Wyomissing, Pa.
Filed Nov. 17, 1971, Ser. No. 199,519
Int. Cl. F16k *47/00*
U.S. Cl. 251—124 **1 Claim**

A venturi-ball valve including a body having inwardly tapering, coaxial inlet and outlet passages and an opening extending downwardly from the top of the body and communicating with the inner ends of the passages. Projecting into the body opening and extending beyond the inner ends of the inlet and outlet passages is a tubular retainer which carries a pair of spaced, removable seat rings, one of the seat rings being positioned at the juncture of the body opening and the inlet passage and the other at the juncture of the body opening and the outlet passage. A ball cage containing a sealing ball is slidable along the interior of the retainer and the inner ends of the seat rings by means of an operating stem which projects into the retainer. The ball permits or prevents fluid flow through the outlet passage depending on the position of the cage in the tubular retainer. The tubular retainer, the seat rings, the ball



cage and the operating stem constitute a subassembly which may be readily positioned in the body opening at the time of assembly and removed therefrom for purposes of inspection or replacement of parts subject to wear, such as the seat rings, without disconnecting the valve from the flow line.

3,749,356
ADAPTOR COUPLING FOR FLUID FLOW CONDUITS
James Robert Conley, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Apr. 24, 1972, Ser. No. 246,940
Int. Cl. F16l *37/28*
U.S. Cl. 251—148 **10 Claims**



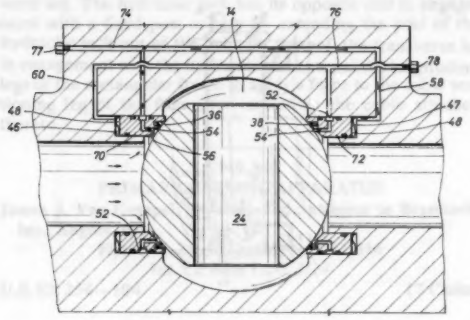
An adaptor coupling for fluid flow conduits includes a central hollow tube having a fluid flow passage therethrough, a first threaded coupler fitting secured to one end of the central tube, and a second threaded coupler fitting rotatably and slidably carried by the central tube. A hand wheel is secured to the second fitting to facilitate connection of the fitting to a fluid flow conduit, and the hand wheel is provided with lugs which extend toward the first fitting. The hand wheel and second fitting are slidable on the central tube between a first position in which the hand wheel can be freely rotated relative to the first fitting and a second position in which the lugs engage mating surfaces on the first fitting to cause the first fitting to rotate with the hand wheel.

3,749,357

VALVE STRUCTURE HAVING FLUID PRESSURE ACTUATED SEATS

James M. Fowler, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,062
Int. Cl. F16k *3/20, 5/18, 5/20*
U.S. Cl. 251—172 3 Claims



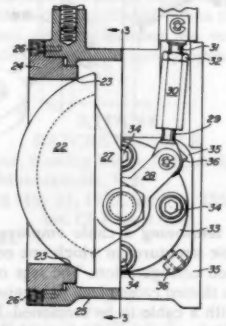
A valve has a body providing a pair of coaxial flow passages and a space between said passages partly occupied by the valve element. Seat rings are located on opposite sides of the valve element and are slidably mounted in the valve body. A sealed chamber at the back of each seat ring is connected by a conduit to the flow passage on the opposite side of the valve. Each seat ring is provided with a resilient seal adapted to engage the valve element. Pressure is conveyed from the upstream side of the valve through the conduit to the chamber at the back of the downstream seat to move it against the valve element. In one embodiment, the valve element is a ball, and in other embodiments, it is a slidable gate or a rotary plug. The pressure applied to the downstream seat partly counterbalances the force applied on the upstream side of the valve element to reduce the transverse thrust on the journal bearings of the ball or rotary plug.

3,749,358

VALVE HAVING ADJUSTABLE SEATING MEANS

Charles Bates, 4182 Crestview Ave., Provo, Utah

Filed Apr. 1, 1971, Ser. No. 130,573
Int. Cl. F16k *1/16*
U.S. Cl. 251—298 7 Claims



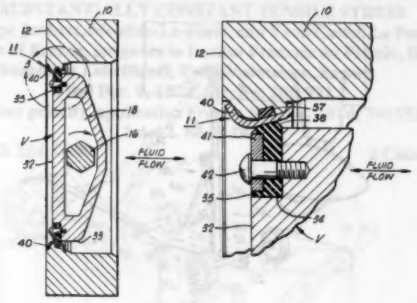
A valve having a valve cavity containing a disk rotated concentrically about an axle having external adjustment means is the subject of this disclosure. The adjustment means adjusts the relative radial position of the axle to the valve body and consequently adjusts the position of the valve disk relative to the valve seat to obtain an efficient seal therebetween without requiring disassembling of the valve. The external radial adjustment means supporting said axle is secured to said valve body.

3,749,359

VALVE SEAT CONSTRUCTION

Robert Paul Montesi, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 24, 1971, Ser. No. 127,621
Int. Cl. F16k *1/226*
U.S. Cl. 251—306 16 Claims



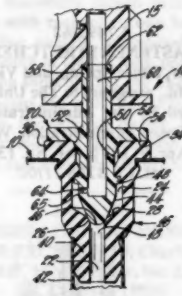
A butterfly valve in which the vane seat is formed of a corrosion resistant stainless steel ring compressedly interlocked axially onto the valve body.

3,749,360

TILTABLE AEROSOL DISPENSING

Richard C. Leimbach, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 27, 1971, Ser. No. 193,010
Int. Cl. F16k *31/58*
U.S. Cl. 251—348 4 Claims



A tilt-type dispensing valve has a resilient valve body member with a configured passageway therethrough, a chamber therein and a valve element located in the passageway. The valve insert member includes a head portion disposed in the chamber to resiliently deform the chamber to provide sealing engagement between the valve body and the valve element. The valve element engages the body and permits relative pivotal movement between the insert member and the body member in response to the application of a lateral force to the protruding portion of the insert member to thereby open a flow passageway through the dispensing valve.

3,749,361

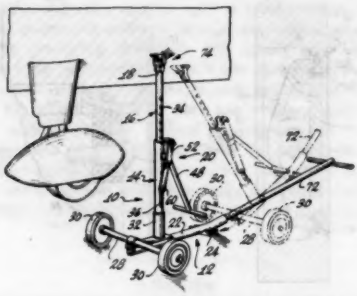
MECHANICAL JACK

Philip L. Johnson, 9710 Ocean Gate, Inglewood, Calif.

Filed Mar. 1, 1972, Ser. No. 230,646
Int. Cl. B60p *1/00*; B66f *1/04, 3/00*
U.S. Cl. 254—2 R 21 Claims

Jack comprises ground engaging base, upright hollow tubular support post on base, load carrying column slidable in post,

and linkages and latches to raise column. Interchangeable heads mounted on top of column are shaped and arranged for different loading conditions. An actuating lever is pivotally mounted on a fulcrum fixedly attached to the post and has a long manual operating arm and a short, forked actuating arm extending in the opposite direction. Tension links pivoted at



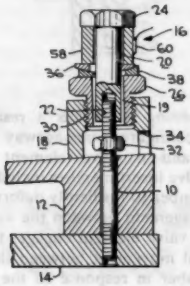
their upper ends to the free ends of the forks carry latch pins at their lower ends spring biased to enter axial slots at opposite sides of the post and engage selected apertures axially spaced in columns. Lowering operating arm raises links, pins, and column. Lock pin passed through higher apertures in column rests on top of post to support load, and latch pins may be lowered to engage new apertures for successive lifting stages.

3,749,362

FASTENER STRETCHER

Joseph W. O'Connor, Silver Spring, and Victor C. Orem, Glen Burnie, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 9, 1971, Ser. No. 132,849
Int. Cl. B25b *21/00*
U.S. Cl. 254—29 A **8 Claims**



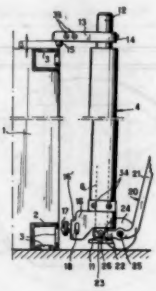
A fastener stretcher for applying a substantially pure axial tensile force to a structural bolt or similar fastening element, comprising a pair of telescoping elements one of which is temporarily secured to the bolt. By spreading the telescoping elements axially, the bolt is tensioned axially to permit a nut or the like to be threaded thereon with a minimum of torque; when the elements are then removed from the bolt, the axial forces on the bolt are taken up by the nut to retain the bolt in its stressed state.

3,749,363

JACKS FOR USE WITH CONTAINERIZED CARGOES

Jean Hauser, 7, Avn. de Celle, 92 Meudon La Foret, France

Filed Sept. 13, 1971, Ser. No. 179,672
Claims priority, application France, Jan. 22, 1971, 7102092
Int. Cl. B66f *7/26*
U.S. Cl. 254—45 **6 Claims**



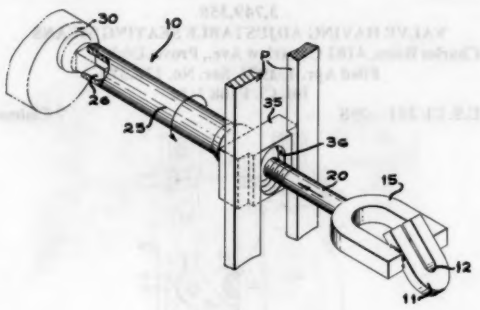
The disclosure relates to jacks for use with the massive type of containerized cargoes which have fittings at the corners for anchoring the containers to transportation devices such as trucks. For the usual container, four of the disclosed jacks are employed, each being readily mounted adjacent a vertical edge of the container. The jacks have a self contained hydraulic fluid reservoir, hydraulic cylinder with piston, motor, and pump for operating the cylinder with the fluid from the reservoir. Control means are provided for operating a set of jacks separately or simultaneously from a distance.

3,749,364

CABLE TENSIONING APPARATUS

Anastacio V. Sanchez, 10775 Foothill Blvd., Cupertino, Calif.

Filed Feb. 22, 1972, Ser. No. 227,991
Int. Cl. B66f *3/10, 3/36*
U.S. Cl. 254—67 **4 Claims**



Apparatus for tensioning a cable employed for repairing deformed yieldable structures in which one end thereof has a generally U-shaped configuration. The legs of the U-shaped end is joined by a slotted cross piece to receive in locking engagement therewith a cable to be tensioned. Extending from the U-shaped end is an integrally formed threaded rod. A threaded impact tube receives the rod in threaded engagement therewith. The free end of the impact tube is suitably notched to receive a conventional air operated impact wrench. Between the U-shaped end and the impact tube is an abutment member that has a suitable opening to receive the rod. The abutment member engages a fixed post or bar to maintain a stationary position. When the impact wrench rotates the impact tube, the impact tube engages the abutment member to maintain a fixed location longitudinally while

rotating about its axis. As a consequence thereof, the rod is drawn into the tube and the U-shaped end applies a tension to the cable attached thereto.

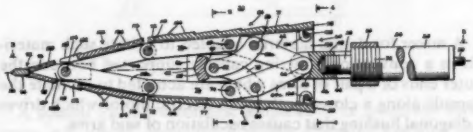
In a modification thereof, a rectangular frame has a transverse end thereof notched to receive a cable to be tensioned. The opposite transverse leg engages one end of a conventional hydraulic jack to apply a force thereto by the hydraulic jack in a longitudinal direction away from the cable retaining transverse leg. The hydraulic jack has its opposite end in engagement with a fixed post or bar. By extending the post of the hydraulic jack out of the cylinder thereof, the transverse leg in engagement with the hydraulic tracks urges the longitudinal legs of the rectangular frame to apply a force to the cable tensioning leg of the frame for tensioning the cable attached thereto.

3,749,365

PRIMARY OPENING APPARATUS

James J. Van Gompel, Fremont, Ind., assignor to Brammell, Inc., Angola, Ind.

Filed Jan. 26, 1972, Ser. No. 221,016
Int. Cl. B66f *1/00, 3/24*
U.S. Cl. 254—104 **17 Claims**



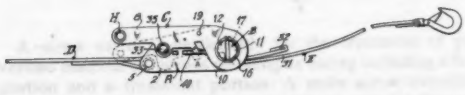
Apparatus for forming a primary opening in a collapsed roll of sheet stock. A first pair of longitudinally elongated shoes is arranged on opposite sides of a longitudinal axis which passes through a frame element, and a fluid power cylinder is connected to move the shoes outwardly away from and inwardly toward the frame and the axis between extended and retracted positions. A second pair of longitudinally elongated shoes is disposed between the first pair of shoes and a pointed nose member on the axis. The front ends of the second shoes are pivotally connected to the nose member at a common point on the axis and the rear ends are respectively removably pivotally connected to the front ends of the first shoes, the nose member and the first and second shoes forming a generally wedge-shaped configuration in the retracted position. A retainer member is removably connected to the first shoes for retaining their rear ends in their retracted position so that the first shoes are inclined upwardly and forwardly to their front ends upon actuation of the cylinder. When the nose member, second shoes and retainer member are removed, the first shoes are extended laterally outwardly upon actuation of the cylinder.

3,749,366

RATCHET BUCKLE

Robert J. Brucker, Basking Ridge, N.J., assignor to Kinedyne Corporation, Mountainside, N.J.

Filed May 22, 1972, Ser. No. 255,794
Int. Cl. F16g *11/12*
U.S. Cl. 254—164 **11 Claims**



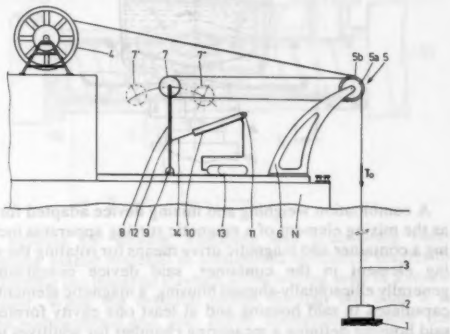
A web-tensioning device has a body in which is journaled a drum having a ratchet with which coacts a pawl pivoted on an oscillatable operating lever which is connected to the frame coaxially with the drum to tension the web and is swung into a rest position when the web is taut where it is held by a positive, quick releasable latch which is protected against accidental release. A back-stop or locking pawl coacts with the ratchet to hold the web taut and is released upon manual movement of the lever beyond its said rest position so the angle of web-tensioning swing of the lever may be greater than is generally possible with prior art devices.

3,749,367

DEVICE FOR MAINTAINING A FLEXIBLE LINE UNDER A SUBSTANTIALLY CONSTANT TENSILE STRESS

Philippe Joubert, Meudon-La-Foret, and Yvon Castel, Le Pecq, both of France, assignors to Institut Francais du Petrole, Des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Dec. 8, 1971, Ser. No. 205,922
Claims priority, application France, Feb. 16, 1970, 7045510
Int. Cl. B66d *3/08*
U.S. Cl. 254—189 **2 Claims**



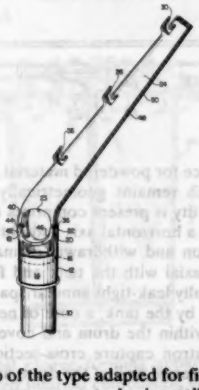
This device for maintaining substantially constant the tensile stress applied to a flexible line particularly adapted for equipping the drilling floating installations, comprises the combination of a stationary return member and a return member moveable with respect to one holding point of the flexible line, said line passing successively over said return members while forming at least a loop portion, the moveable return member being supported at the end of a pivotable arm actuated by jack means fed with pressurized fluid from an oil and air accumulator, the jack rod having, for each position of the moveable return member, a direction different from that of the travel path of said moveable return member.

3,749,368

HINGED LOOP CAP MEMBER

Richard G. Miller, R.F.D. 7 Box 150, Charlottesville, Va.

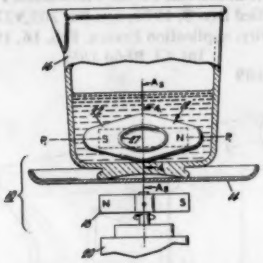
Filed Mar. 15, 1972, Ser. No. 234,942
Int. Cl. E04h *17/06*
U.S. Cl. 256—11 **7 Claims**



Hinged loop cap of the type adapted for fitting upon the top of a fence post, so as to support a horizontally extending fence

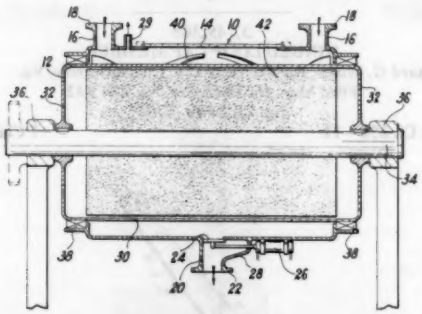
top rail. The loop caps may also include a wire strand supporting arm extending diagonally above and away from the loop cap.

3,749,369
MAGNETIC STIRRING ELEMENT
Kurt Landsberger, c/o Bel-Art Products, Pequannock, N.J.
Filed July 9, 1971, Ser. No. 161,009
Int. Cl. B01f *13/08*
U.S. Cl. 259—1 R **4 Claims**



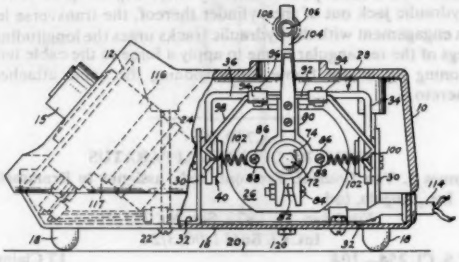
A combination weighing and mixing device adapted for use as the mixing element of a magnetic stirring apparatus including a container and magnetic drive means for rotating the mixing element in the container, said device comprising a generally ellipsoidally-shaped housing, a magnetic element encapsulated in said housing and at least one cavity formed in said housing defining a measuring chamber for additives to be mixed with a liquid in the container.

3,749,370
MIXING DEVICE FOR POWDERED MATERIALS
Albert Clech, Hainneville; Georges Marchand, Clamart; Jean-Yves Pasquiou, Equerdreville, and Jacques Regnier, Cherbourg, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France
Filed June 16, 1971, Ser. No. 153,649
Int. Cl. B01f *7/04, 15/00*
U.S. Cl. 259—10 **6 Claims**



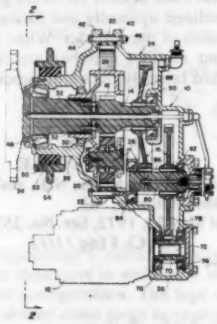
The mixing device for powdered material and especially fissile material which remains geometrically subcritical even when a large quantity is present comprises a stationary cylindrical tank having a horizontal axis and obturatable openings for the introduction and withdrawal of materials ; a rotary drum which is coaxial with the tank and forms the internal wall of a substantially leak-tight annular space whose external wall is constituted by the tank; a core of neutron-moderating material located within the drum and covered with material having a high neutron capture cross-section ; stirring arms mounted on the external wall of the drum and means for driving the drum in rotation.

3,749,371
DENTAL MATERIAL MIXER
Richard P. Folkenroth, and William G. Mader, both of York, Pa., assignors to Dentsply International Inc., York, Pa.
Filed July 14, 1971, Ser. No. 162,470
Int. Cl. B01f *11/00*
U.S. Cl. 259—72 **13 Claims**



A mixer for dental material adapted to agitate such materials in a conventional mixing capsule supported between the outer ends of a pair of arms which are actuated to oscillate the capsule along a closed path by an electric motor which drives a diagonal bushing that causes oscillation of said arms.

3,749,372
YIELDABLE SUPPORT MEANS AND DRIVE MECHANISM FOR CONCRETE MIXER DRUMS
Joseph C. Funk, Coffeyville, Kans., assignor to Funk Mfg. Company, Coffeyville, Kans.
Filed Jan. 27, 1972, Ser. No. 221,345
Int. Cl. B28c *5/18*
U.S. Cl. 259—177 R **10 Claims**



A drive mechanism for concrete mixer drums which includes a suitable gear reducing means or transmission having an output shaft rigidly secured to the mixer drum for transmitting rotation thereto. The transmission is supported by a yieldable or flexible annular support member interposed between the transmission housing and an outer ring which is secured to the truck or vehicle supporting the mixer drum.

3,749,373

APPARATUS FOR PREPARING DOUGHS OR SIMILAR MATERIAL

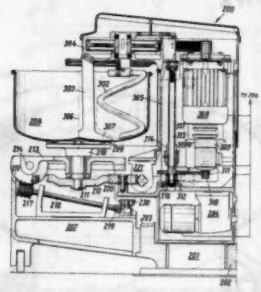
Kate Kemper, Lange Strasse 8-10, D4833 Neuenkirchen uber Gutersloh, Germany

Filed Nov. 30, 1970, Ser. No. 93,684

Claims priority, application Germany, Nov. 28, 1969, P 19 59 799.0

Int. Cl. A21c 5/00, 1/00; A23g 1/00, 1/10; B29b 1/04

U.S. Cl. 259—185 15 Claims



A system for the automatic preparation of paste-like mixtures, e.g. dough, including a charge kneading machine station, at least two vessels each capable of containing a mass of such mixture for treatment by the kneading machine, a plurality of mixture processing stations, and means for automatically moving the vessels along a path between the stations and controlling the operation performed on the mixture at each station.

3,749,374

SCREW EXTRUDER FOR THE TREATMENT OF PULVERIZED MATERIAL

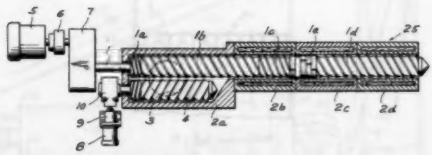
Dieter Buchheit, Ditzingen, Germany, assignor to Werener & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Dec. 6, 1971, Ser. No. 205,126

Claims priority, application Germany, Dec. 10, 1970, P 20 60 706.1

Int. Cl. B01f 7/08

U.S. Cl. 259—192 7 Claims



A screw extruder particularly for the treatment of pulverized material comprises an elongate casing including a feed portion and a treatment portion. A main screw extending along the length of the casing is rotatably mounted in the same and a short auxiliary screw is rotatably mounted in the feed portion of the casing parallel with the main screw but not in mesh with the same. Each of the screws is driven by its own drive means and the rotational speed of the auxiliary screw can be varied independently of the rotational speed of the main screw.

3,749,375

PROCESS FOR MIXING, KNEADING AND GRANULATING THERMOSETTING PLASTIC MATERIAL IN CONTINUOUS OPERATION

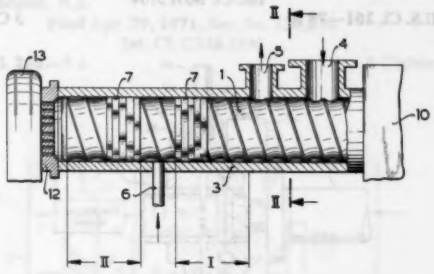
Heinz Hermann, Stuttgart, and Herbert Ocker, Leonberg, both of Germany, assignors to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Feb. 7, 1972, Ser. No. 224,087

Claims priority, application Germany, Feb. 19, 1971, P 21 07 927.6

Int. Cl. B01f 7/08

U.S. Cl. 259—192 4 Claims



A process for mixing, kneading and granulating thermosetting plastic material in continuous operation resides in first feeding the material through a first mixing zone of a screw extruder. While the material passes through this zone it is mixed,homogenized,and also partly condensed. Before the material reaches a second mixing zone in the extruder an agent adapted to interrupt the condensation reaction in the material and to reduce the viscosity thereof is fed into the extruder. This agent is intimately intermingled with the material as the same passes through the second mixing zone thereby interrupting the condensation reaction and reducing the viscosity of the material. After passing through the second zone, the material is extruded through a perforated discharge plate at the end of the extruder and finally granulated by suitable cutting means disposed directly adjacent to the exit side of the perforated plate.

There is also disclosed an extruder arranged for carrying out the process of the invention.

3,749,376

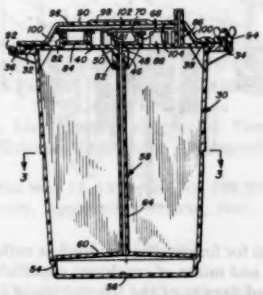
VAPOR INJECTOR FOR ENGINES

Gerald F. Alm; Donald S. Alm; Ralph R. Harvey; Robert L. Harvey, all of Grangeville; Ray L. Andrews, Kooskia, all of Idaho, and Keith B. Lewis, Everett, Wash., assignors to Vic Chemicals, Inc., Grangeville, Idaho

Filed June 12, 1970, Ser. No. 45,635

Int. Cl. B01f 3/04

U.S. Cl. 261—18 A 5 Claims



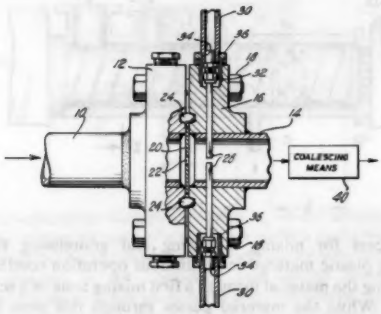
A supplemental charge forming apparatus for use with a naturally aspirated internal combustion engine provided with

conventional charge forming structure. The supplemental charge forming apparatus is operable to admit additional amounts of air and vaporized fuel mixture into the intake passages of the associated internal combustion engine in amounts increasing proportional to decreases in engine manifold vacuum.

3,749,377
ORIFICE SCRUBBER FOR REMOVING SOLID PARTICLES FROM HIGH PRESSURE GAS

William L. Slater, La Habra, Calif., and Odes B. Robertson, Graves, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 6, 1968, Ser. No. 750,592
Int. Cl. B01f 3/04
U.S. Cl. 261—78 R 3 Claims

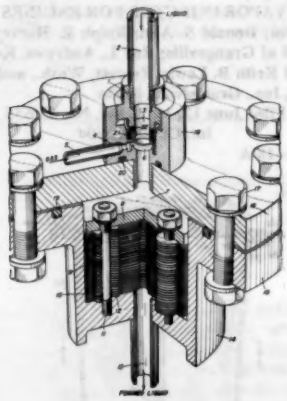


Scrubbing a gas by injecting a wash liquid directly into a high speed jet stream formed by passing said gas thru a restricted plate orifice at a substantial pressure, atomizing the wash liquid in the jet stream and thereafter coalescing the water droplets containing contaminant materials.

3,749,378
PRODUCING A FOAMED LIQUID

David Rhodes, Banbury, Broughton Park, England, assignor to General Foods Limited, Banbury, Oxon, England

Filed May 28, 1971, Ser. No. 147,923
Int. Cl. B01f 3/04
U.S. Cl. 261—78 A 2 Claims

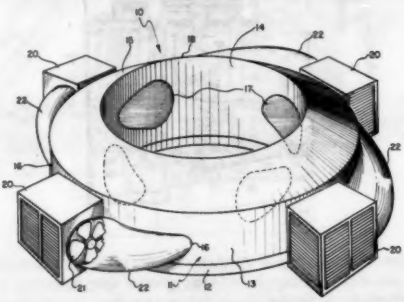


An apparatus for foaming liquids such as coffee extract, tea extract, juices and mixes of emulsions capable of controlling the fineness and density of the foamed liquid consisting of a mixing zone in which gas is introduced into the liquid under pressure and a second zone containing a plurality of spaced, flat annular plates which define numerous paths through which the foam must pass. The foamed liquid may be dried by freeze drying or spray drying. The apparatus is particularly useful in a process for producing a spray dried product.

3,749,379
SYSTEM FOR THERMAL EXHAUST

Dale H. Brown, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 7, 1971, Ser. No. 131,980
Int. Cl. B01f 3/04
U.S. Cl. 261—79 A 2 Claims

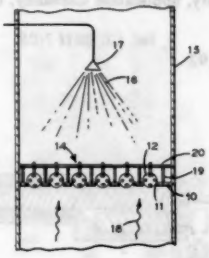


In the rise of plumes of hot gases into the atmosphere from the exhaust port of a cooling tower, it has been found that a substantial increase in the cross-sectional area of the exhaust port produces a substantial increase in the height of the plume. For a given rate of thermal exhaust enlargement of the cross-sectional area is accompanied by reduction in the velocity of flow of gases from the exhaust port.

3,749,380
ABSORPTION OPTIMIZATION

Stephen S. Strom, and Henry P. Markant, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 2, 1971, Ser. No. 130,738
Int. Cl. B01d 53/12, 53/04; B01j 9/06
U.S. Cl. 261—98 5 Claims



An apparatus which limits the movement of spheres of a fluidized bed to a linearly defined vertical path having hardly any horizontal breadth in a free flow area above such bed which is equivalent to between 3.5 and 5.0 times the diameter of the spheres for the optimization of the process of absorption. In other embodiments, the spheres of the bed are arranged in overall patterns according to their individual weight.

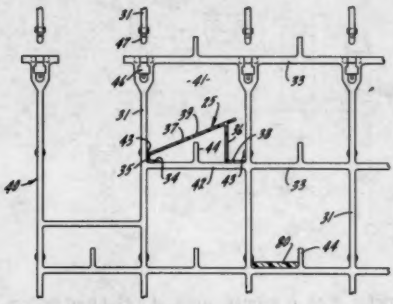
A process of maintaining improved overall absorption efficiencies in a tower of the spray variety by maintaining a constant holdup of liquid to gas flow ratio in the contact zone over a wide range of gas loads through the use of the aforesaid apparatus.

3,749,381

FILL HANGER

Donn B. Furlong, and Samuel Luzaich, both of Santa Rosa, Calif., assignors to Ecodyne Cooling Products Company, Chicago, Ill.

Filed Aug. 12, 1970, Ser. No. 63,150
Int. Cl. B01f 3/04
U.S. Cl. 261—111 3 Claims



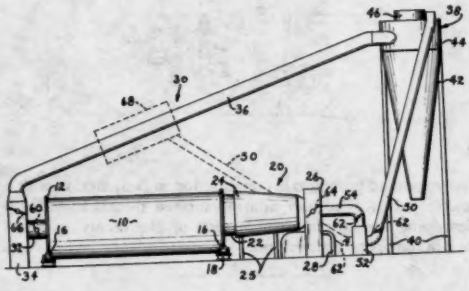
A fill assembly for a cooling tower comprising a plurality of fill strips positioned within the fill area, a plurality of spaced apart vertically suspended fill hangers positioned transversely with respect to said fill strips within said fill area, said fill hangers having a plurality of substantially horizontally and generally vertically extending members which intersect one another to form a plurality of parallelogram grids, each of said fill strips being supported by a horizontal portion of one of said parallelogram grids of at least two of said fill hangers, and each of said parallelogram grids including means associated with said vertically extending members to retain said fill strips in a predetermined position relative to said horizontal portion. Also provided are unique snap-lock joints to attach adjacent fill hanger sections and horizontal and transverse stabilizers to increase the stability of the fill assembly.

3,749,382

CROP DEHYDRATOR AND METHOD

Stanley P. Thompson, 2718 Osborn Rd., Topeka, Kans.

Filed Apr. 19, 1971, Ser. No. 135,068
Int. Cl. F27b 7/00
U.S. Cl. 432—58 7 Claims



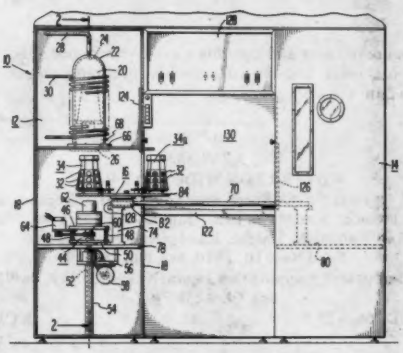
A method and apparatus for dehydrating agricultural crops utilizes the product gases from the combustible dryer fuel as the medium for pneumatically conveying the crop through the drying zone. A horizontally disposed drying drum has an inlet at one end and an outlet at the opposite end. The inlet communicates with the fuel source and the outlet is coupled with a cyclone separator for removing the dried crop from the conveying medium. Structure disposed at the top of the separator returns the combustion gases to the drying drum. A blower fan at the outlet end of the drum assures a continuous flow of gases and fresh air throughout the apparatus. By utilizing the combustion gases as the conveying medium, the oxygen content within the drum is reduced and the combustion of foreign contaminants and dry, thin, particles of the crop is minimized.

3,749,383

APPARATUS FOR PROCESSING SEMICONDUCTOR DEVICES

Edward Harold Voigt, Summit, and William Bernard Hall, Stockton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 29, 1971, Ser. No. 138,632
Int. Cl. C21d 1/06
U.S. Cl. 266—5 A 6 Claims



Apparatus for growing epitaxial layers of semiconductor material on substrate wafers at a relatively high production rate comprises a reactor furnace and a loading device cooperatively associated with it. An elevator is disposed to raise, and to lower, a holder for the wafers through an opening in the bottom of the heating chamber of the furnace. The loading device comprises an arm disposed for rotation on a carriage that is slidable towards and away from the elevator. The holder is adapted to be disposed on either end of the rotatable arm for delivery to, and for removal from, the furnace. When the loading device is disposed for movement between two furnaces, three wafer holders can be used for processing wafers at a high rate of production.

3,749,384

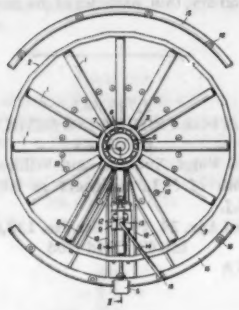
PROCESS AND APPARATUS FOR QUENCHING WITHOUT DISTORTING ROTATION-SYMMETRICAL WORK PIECES HEATED TO HARDENING TEMPERATURE

Hans Werner, Linz, Austria, assignor to Vereinigte Osterreichische Eisenund Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Nov. 18, 1971, Ser. No. 199,937
Claims priority, application Austria, Nov. 30, 1970, A 10746/70
Int. Cl. C21d 1/62
U.S. Cl. 266—6 PC 7 Claims

The invention relates to a process and apparatus for quenching rotation-symmetrical work pieces having a projecting rim portion such as a flange, without distorting them. This

is achieved by supporting the work piece by groups of rollers engaging said rim portion and possibly also the adjoining zone



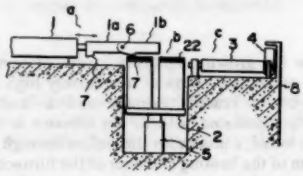
of the arched part and creating a relative movement between the work piece and the rollers while splashing a quenching liquid onto the work piece.

3,749,385

CUTTER FOR WIDE FLAT BARS

Kiichi Ogawa; Setsuo Shoji, and Tomoyoshi Sukegawa, all of Yokohama, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Nov. 10, 1970, Ser. No. 88,278
Claims priority, application Japan, Nov. 17, 1969, 44/91609
Int. Cl. B23k 7/02
U.S. Cl. 266—23 B 8 Claims



An automatic line cutter for wide flat bars comprises a stand for supporting flat bars, a cutting station, a flat bar feeding apparatus for feeding bars to a conveyor line which carries flat bars to a guidable cutter torch located at the cutting stand. A dropping stand is provided for delivering the finished cut product.

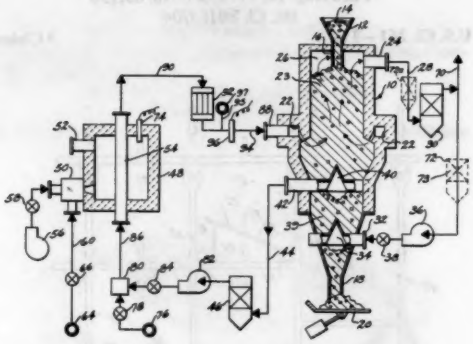
3,749,386

METHOD AND MEANS FOR REDUCING IRON OXIDES IN A GASEOUS REDUCTION PROCESS

Donald Beggs, Toledo, and William T. Marston, Whitehouse, both of Ohio, assignors to Midland-Ross Corporation, Toledo, Ohio

Division of Ser. No. 883,889, Dec. 10, 1969. This application July 1, 1971, Ser. No. 158,905
Int. Cl. F27d 17/00
U.S. Cl. 266—29 5 Claims

This is a disclosure of a method and apparatus for reducing iron oxides to metallized pellets and includes the desulphurization of gases containing sulphur and/or compounds of sulphur, especially H_2S. The disclosure is particularly concerned with the metallization of iron oxides through a gaseous reduction process wherein the spent gas is used to cool the pellets before discharge from the furnace, and then is upgraded for continued use. It has also been found that activated



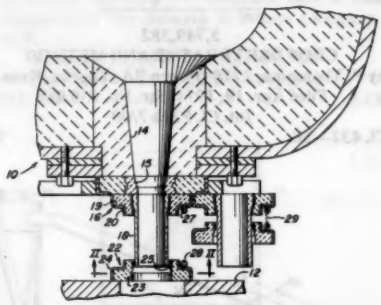
iron particles, such as sponge iron and metallized pellets, are highly effective for the removal of sulphur impurities from such gas.

3,749,387

METHOD AND DEVICE FOR SHROUDING A STREAM OF METAL TEEMED THROUGH A SLIDABLE GATE

Sigmund L. Andrzejak, Chicago, and Raymond B. Berg, Calumet City, both of Ill., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 4,965, Jan. 22, 1970, abandoned. This application Mar. 16, 1972, Ser. No. 235,387
Int. Cl. C21b 7/14
U.S. Cl. 266—38 2 Claims



An extended tube nozzle construction in conjunction with a slidable gate for bottom pouring molten metal. Includes a telescoping shroud plate which rests on the receiving vessel when in the operating position.

3,749,388

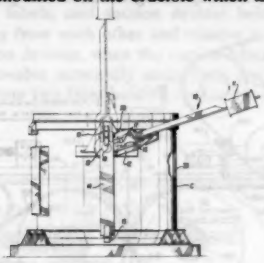
CRUCIBLE BAIL LOCKING DEVICE

Henry S. Cook, and Robert E. Schwartz, both of Owensboro, Ky., assignors to National-Southwire Aluminum Company, Carrolton, Ga.

Filed Sept. 28, 1971, Ser. No. 184,384
Int. Cl. F27d 15/00
U.S. Cl. 266—39 3 Claims

This disclosure relates to a device for locking a crucible bail in a vertical position relative to a crucible adapted to contain

and transport molten metal. The locking device includes a latch pivotally mounted on the crucible which is engageable



with a U-shaped bracket carried by the bail for locking the bail angularly with respect to the crucible.

3,749,389

LEAF SPRING HAVING AN IMPROVED FASTENING CLIP

Michel Duchemin, Lambres-les-Douai, France, assignor to Ressorts Du Nord S.A., Douai, France

Filed July 29, 1971, Ser. No. 167,289

Claims priority, application France, Aug. 4, 1970, 7028761

Int. Cl. F16f *1/22*

U.S. Cl. 267—52 **4 Claims**

Leaf spring having at least one lead and a fastening clip in the centre part of the leaf or leaves. A corrugation extending throughout the width of the leaf or leaves adjoins two corrugations in the clip on each side of the leaf or assembled leaves.

3,749,390

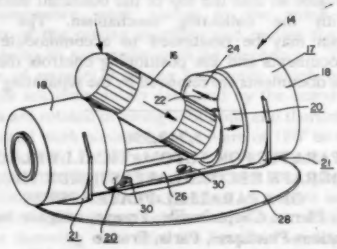
HIGH SPEED AMALGAMATOR UNIVERSAL CAPSULE HOLDER

Thomas J. Schubert, New York, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 17, 1971, Ser. No. 209,259

Int. Cl. B25b *5/00*

U.S. Cl. 269—254 **7 Claims**



A capsule holder has a retainer, the latter having an open area in the center thereof for the insertion of a capsule between two spring biased detents. The detents are reciprocably confined within the ends of the retainer, and biased toward the center thereof. The opposing faces of the detents are shaped to securely accommodate all makes of capsules, and each detent has an open extending therethrough to accommodate capsules having a neck or other extension thereon.

3,749,391

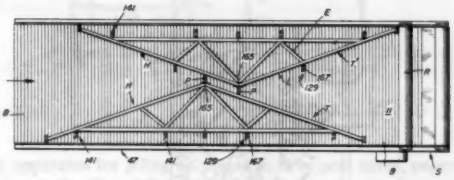
ADJUSTABLE FIXTURE MEANS FOR MAINTAINING WOODEN TRUSS MEMBERS IN PROPER POSITION DURING FABRICATION OF A TRUSS

Gail H. Templin, Vero Beach, Fla., assignor to TCT Engineering, Inc., Vero Beach, Fla.

Division of Ser. No. 105,253, Jan. 11, 1971, Pat. No. 3,667,379. This application Feb. 17, 1972, Ser. No. 227,557

Int. Cl. B23q *3/02*

U.S. Cl. 269—321 F **2 Claims**



Apparatus for fabricating wood trusses, providing a jig including a moving platform, upon which metal truss plates are placed in proper position on the tops and bottoms of the joints of the wood truss members for embedment therein. The platform being composed of a plurality of slats and the slats being spaced apart, providing areas therebetween for receiving and clamping thereto in adjusted positions fixtures abuttable with the members of the truss to maintain them in proper position on the platform.

3,749,392

COLLATOR

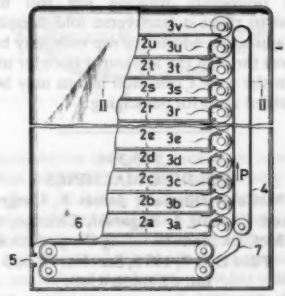
Nobuyuki Yanagawa, Kanagawa-ken, Yamada, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1971, Ser. No. 128,757

Claims priority, application Japan, Apr. 6, 1970, 45/28579; June 20, 1970, 45/53204; July 22, 1970, 45/72690 (utility model); July 29, 1970, 45/65802

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **12 Claims**



A collating device having an array of shelves for receiving sheets to be collated, a belt for conveying the sheets along a path traversing the array of shelves, and a set of feed rollers associated with each shelf. All the sets of rollers are arranged to rotate normally in one direction and disposed to cooperate with the belt, when rotating in that direction, to feed succes-

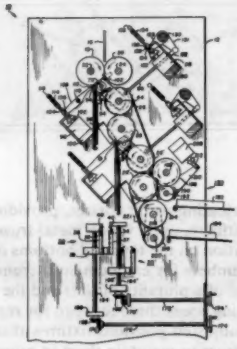
sive sheets past the shelves. Means are provided for selectively rotating a particular set of feed rollers in reverse direction for feeding a sheet to a particular selected shelf. The sets of rollers respectively associated with successive shelves may be subjected in succession to the reverse rotation so that successive sheets are respectively delivered to the successive shelves.

3,749,393

FOLDING APPARATUS

Robert O. Wolfelsperger, Fairfield, and Patrick J. Pinto, Freehold, both of N.J., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed July 30, 1970, Ser. No. 59,580
Int. Cl. B65h *45/18*
U.S. Cl. 270—67 **12 Claims**



Apparatus for placing one or more folds in a web of material of discrete length wherein the web of material, which may be a longitudinally folded and flattened bag of polyethylene or the like, is fed through a pair of oppositely rotating draw rolls. After a predetermined segment of the web has been drawn into the apparatus by the draw rolls, a detecting means in the apparatus detects the presence of the web and actuates a first folding mechanism rotatably mounted about a first nip roll vertically displaced from the draw rolls. The folding mechanism contacts the moving web along an intermediate portion thereof and moves it toward the nip roll where the web is tucked between the first nip roll and a second vertically displaced and oppositely rotating nip roll to be drawn therebetween to place a transverse fold therein. Additional folder mechanisms on additional nip rolls may be provided as the web moves through the apparatus in order to place two or more folds in the web. Collection means may be provided to collect the folded webs for packaging.

3,749,394

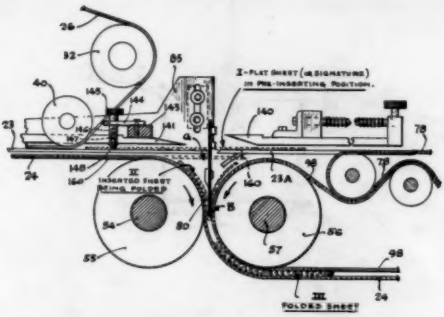
FOLDING MACHINES

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Edward J. Zagorski, Chicago, all of Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.

Filed Oct. 7, 1970, Ser. No. 78,663
Int. Cl. B65h *45/04*
U.S. Cl. 270—80 **1 Claim**

A machine folds a sheet by inserting a sheet in the bight between a pair of folder rollers, which may be varied in their separation to accomodate sheets having different folding characteristics.

The sheet to be folded is first located in a preinserting position, lying in a plane which spans the gap between the folder rollers, and insertion is made by an inserter blade which strikes the sheet at its medial area and drives it into the roller bight. To condition the sheet for an accurate fold, a shuttle supports the sheet spanning the aforesaid gap until the time



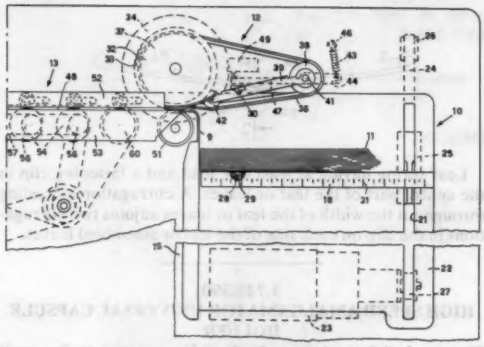
just prior to the inserter blade striking the sheet. The sheet may be tensioned or pulled taut in its pre-inserting position.

3,749,395

DEVICE FOR FEEDING AND SORTING DOCUMENTS

Fedele Bazzarone, Caluso (Turin), and Dario Bisone, Montalto Dora (Turin), both of Italy, assignors to Ing. C. Olivetti & C. S.p.A., Turin, Italy

Filed June 14, 1972, Ser. No. 262,804
Int. Cl. B65h *1/18, 3/04, 31/10*
U.S. Cl. 271—4 **6 Claims**



This device includes a station for separating documents from a stack, one by one, with the platform upon which the stack rests being automatically movable so that the top of the stack remains next to the separating mechanism. The device further includes two collecting platforms which are automatically movable so that the top of the collected stack remains level with the collecting mechanism. The collecting mechanism may be positioned to accommodate different length documents and the positioning controls the speed at which the documents are removed by the separating station.

3,749,396

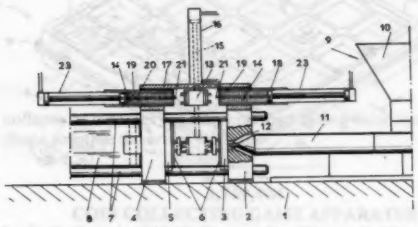
APPARATUS FOR AUTOMATICALLY PLACING PHONOGRAPH RECORD LABELS INSIDE THE MOULD OF A PARALLEL-PLATEN PRESS

Marcel J. Pierre, Cheptainville, France, assignor to Material Applications Plastiques, Paris, France

Filed Feb. 8, 1971, Ser. No. 113,590
Claims priority, application France, Feb. 12, 1970, 7004973
Int. Cl. B65h *3/08, 5/10*
U.S. Cl. 271—5 **5 Claims**

An apparatus for automatically placing a pair of phonograph record labels inside the mold of the parallel-platen

press. The apparatus includes a carrier head having movable suction devices fitted at opposite ends thereof and disposed for holding the labels, said suction devices being movable toward and away from each other and relative to the carrier head. The suction devices, when the carrier head is in a first position, are movable outwardly away from one another to pick up labels from two label holding magazines arranged on



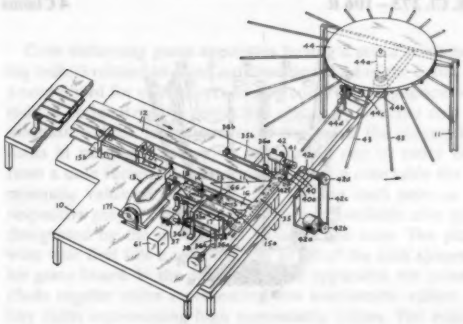
opposite sides of the carrier head. A transfer device is connected to the carrier head for moving same from said first position to a second position located between the two open halves of the press mold, whereupon the suction devices are again moved outwardly away from one another to simultaneously deposit the two labels inside the two open halves of the mold.

3,749,397

WORK HANDLING MECHANISM FOR SEWING APPARATUS

Roderick G. Timm, 7 Algonquin Dr., Newburgh, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,702
Int. Cl. B65h *29/40*
U.S. Cl. 271—70 **8 Claims**



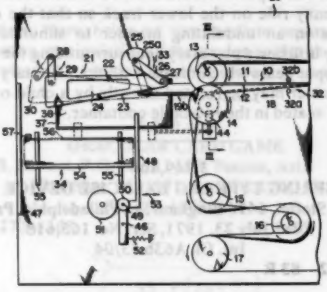
Apparatus for automatically stacking work pieces discharged from a sewing machine after the performance of a hemming operation. Involves an endless conveyor belt which delivers successive work pieces to the stitch forming mechanism of the sewing machine and carries the stitched work pieces to an automatic stacking mechanism. The latter has a pair of parallel throwing rods onto which successive work pieces are individually delivered by the conveyor belt. These rods are rotated or swing about one end thereof to carry each delivered work piece through an arc of 180° to deposit it onto a stationary catching rod. Rods continue to rotate through an arc totaling 360° to smooth each work piece on the catching rod and to return to position to receive next work piece. Photoelectric means automatically controls the operation of the throwing rods after the hemmed work piece has been delivered into the region thereof. A plurality of work pieces may be delivered to a single stationary catching rod. A shiftable member, such as a turntable, carries a plurality of such catching rods that are successively brought into the region in which they will receive hemmed work pieces from the throwing rods.

3,749,398

APPARATUS FOR PILING UP SHEETS

Atsushi Fujita, Shinagawa-ku, Tokyo, and Teruhiko Uchida, Kohoku-ku, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 7, 1972, Ser. No. 216,143
Int. Cl. B65h *31/00*
U.S. Cl. 271—86 **30 Claims**



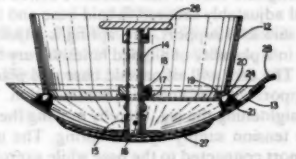
In apparatus for piling up sheets such as post cards, paper monies or the like of the type comprising a conveyor for successively conveying a number of sheets, horizontal guide means for successively guiding the sheets discharged from the discharge end of the conveyor in a direction substantially in alignment with the conveyor and for forcing the sheets downwardly, and a sheet receiver located below the horizontal guide means for successively piling up the sheets therein, there is provided bending means close to the discharge end of the conveyor for bending the sheets in a direction perpendicular to the direction of movement thereof.

3,749,399

OCCUPANT PROPELLED ROUND-ABOUT DEVICES

Richard M. Fedor, 2662 Shaker Rd., Cleveland Heights, Ohio, and Russell B. Polo, 5400 Snow Rd., Parma, Ohio

Filed Nov. 2, 1970, Ser. No. 85,902
Int. Cl. A63g *1/12*
U.S. Cl. 272—33 A **5 Claims**



An amusement device including a rotatable container and a base which base may be stationary, or upwardly concave or partly oval in shape, or it may be in the form of an outer container. The rotatable container has a central opening through which a shaft extends from the base. Bearings are arranged between the container and the shaft around which the container may be rotated and the shaft is provided with a wheel by means of which a child or a group of children in the rotatable container may exert a pulling or pushing action to cause rotation of the container. The base may be upwardly concave or partly oval in shape so that the device may be utilized as a sled in which case it may have runners thereon or it may provided with a hook or have projections secured thereto as by welding to which a sled or snowmobile may be attached. Balls may also be arranged between the base and a groove at the junction of the side and bottom walls of the container to facilitate the

rotation of the container. Balls may also be arranged in a groove at the periphery of the base member upon which the container rides when the base is in the form of a container, or the base may be in the form of a container having water therein and the shaft may be secured to the outer wall of the container by a universal joint so that the container may be rotated in planes inclined to the vertical axis of the outer container to cause waves in the water in the outer container. A track having upper and lower flanges may also be secured to the shaft or to the base plate, some portions of which are higher than other portions and a set of rollers secured to the container may ride on the lower track so that the container may rotate in an undulating manner to simulate a roller coaster. By utilizing a planetary gear surrounding the shaft and providing spur gears which meash with the planetary gear, the inner container may be rotated directly by a child or a group of children seated in the rotatable container.

3,749,400

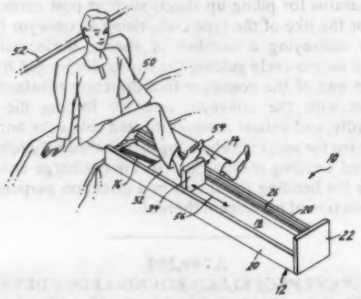
SPRING TYPE LEG EXERCISE DEVICE

Charles R. Stoffel, 6416 Bingham St., Philadelphia, Pa.

Filed July 23, 1971, Ser. No. 165,618

Int. Cl. A63b *23/04*

U.S. Cl. 272—83 R **2 Claims**



A leg exercise device comprising an elongated base having a pair of guide tracks thereon. A foot support is longitudinally movable along said base in said tracks. A coiled tension spring has one end adjustably secured in said base and the other end secured to said foot support. The spring is adjustably secured to the base in a plurality of aligned holes to vary the tension in the spring. The user will sit on said base and place his foot in the foot support with his knee in a bent position. The device is used by straightening the leg, thereby moving the foot support against the tension supply by said spring. The user sits on a hinged support connected to the base while exercising.

3,749,401

TIC-TAC-TOE APPARATUS WITH POCKETS HAVING REBOUNDING SURFACES

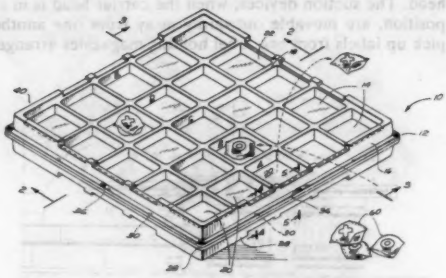
Richard Hayko, 712 Tulip St., Liverpool, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,558

Int. Cl. A63b *71/02*

U.S. Cl. 273—95 R **20 Claims**

A game for playing a variation of tic-tac-toe includes a frame having a plurality of openings therein arranged in a number of parallel rows. A plurality of parallely extending strips of resilient material are mounted in a frame adjacent these openings, with each strip being associated with an individual row of openings and spanning the openings in that row. A plurality of individual projectile means are provided for selective projection at and into any one of the openings formed in the frame for support by the resilient strip associated therewith. When a projectile is thrown with sufficient force into one of the openings, it causes the strip onto which it



is projected to flex and expel any other projectile supported thereon, in another of that strip's associated openings, out of the play area or into another frame opening.

3,749,402

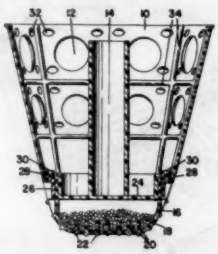
BEAN BAG WITH HANDLE AND STABILIZING VANE

Cecil F. Adickes, Playa Del Rey; Thomas S. Beaubien; George R. Weir, both of Palos Verdes, and Eugene J. Echterling, Woodland Hills, all of Calif., assignors to Innova Incorporated, Playa Del Rey, Calif.

Filed Jan. 24, 1972, Ser. No. 220,038

Int. Cl. A63b *65/00*

U.S. Cl. 273—106 R **4 Claims**



A game or toy aerial projectile comprising an over-sized shuttle combined with a bean-bag and having a handle which may be manually grasped so that the projectile can be projected through the air. The handle is located within the vane of the shuttle. The head of the shuttle is filled with shot to form the bean-bag and a plurality of projections extend within the head to dampen movement of the shot. The outer surface of the head is formed with a plurality of projections to preclude skidding.

3,749,403

ARTIFICIAL GUIDING FEATHER FOR ARROWS

Charles W. Austin, 4318 E. 38th St., and Francis W. Melton, 3836 Beaver Ave., both of Des Moines, Iowa

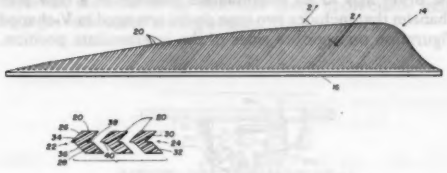
Filed May 26, 1969, Ser. No. 827,689

Int. Cl. F41b *5/02*

U.S. Cl. 273—106.5 C **4 Claims**

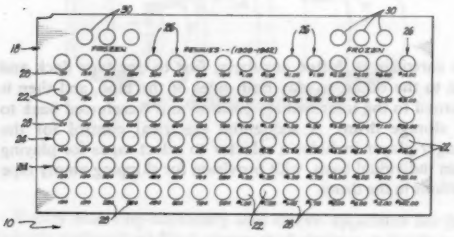
Artificial feathers for arrows each of which is of a one-piece construction and of a soft flexible material such as plastic. Rather than being molded into a solid piece, each feature has

individual barbs that are shaped so that they normally nest with one another. However, the barbs allow each feather to



collapse as it passes the bow and then spring back into normal shape to guide the arrow in flight.

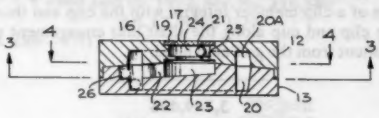
3,749,404
COIN COLLECTING GAME APPARATUS
Leslie R. Oetzel, 1115 W. Venton, San Dimas, Calif.
Filed Nov. 29, 1971, Ser. No. 202,897
Int. Cl. A63f 3/06
U.S. Cl. 273—135 B **5 Claims**



Coin collecting game apparatus having a set of coins bearing indicia related to given numismatic values of the coins, and a coin board for each player having coin receiving spaces with indicia designating the respective spaces by selected coin numismatic values. In the course of the game, the players take turns in randomly removing or drawing one or more coins from a coin receptacle, determining from a coin table the numismatic value of each coin, and placing each coin on the respective player's coin board within any available coin space designated by the numismatic value of the coin. The player wins who first fills a selected row or all of the coin spaces on his game board. In the disclosed game apparatus, the coins include regular coins representing low numismatic values and key coins representing high numismatic values. The number and type of coins selected by each player during each turn are determined by a game board with playing spaces or squares arranged in a row about the board along which the player moves a game piece to a space determined by operation of chance means. The squares contain indicia representing number and type of the coin or coins to be drawn by the player. In the event a player draws a coin already on his coin board, he may "freeze" the coin to remove it from acquisition by an opponent by placing the coin in the freeze saace on his coin board. The game board contains squares directing return of frozen coins to play.

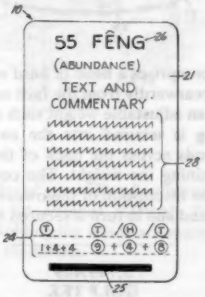
3,749,405
HAND MANIPULATIVE BALL AND RACE PUZZLE DEVICE
Giusto Grattoni, 10067 Colwell Dr., Sun Valley, Calif.
Filed May 15, 1972, Ser. No. 253,046
Int. Cl. A63f 7/04
U.S. Cl. 273—153 R **2 Claims**

A puzzle device consists of a two part opaque hand manipulative closed case in which is a circular race in which a small playing ball rolls freely, there being a central cavity beneath a small viewing window in the top closure of the case; a radial groove intersects the race and connects with the cavity under



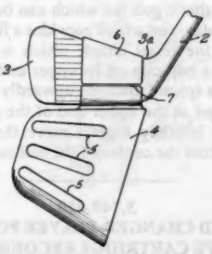
the window, there being an intermediate separating flange which during manipulation of the device guides the ball to the window where it is visible when the puzzle is solved.

3,749,406
ORACULAR CARD GAME
Walter H. Bowart, P.O. Box 12457, Tucson, Ariz.
Filed Mar. 30, 1971, Ser. No. 129,352
Int. Cl. A63f 9/18
U.S. Cl. 273—161 **2 Claims**



In the disclosed game, a deck of essentially 64 cards enables the player or players to consult the I Ching (ancient Chinese "Book of Changes") by drawing at random six (or 18 cards from the deck, each card bearing a "static" or "moving" Yang or Yin line (as well as a hexagram notation), thereby deriving one of the 64 hexagrams of the I Ching. The meaning of the thus-derived hexagram is then obtained by locating the card in the deck which bears the corresponding hexagram notation.

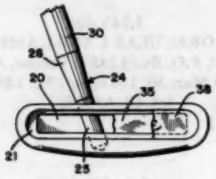
3,749,407
BALL RETRIEVER ATTACHMENT
Lee W. Prochnow, 4103 W. 98th St., Chicago, Ill.
Filed Apr. 12, 1971, Ser. No. 133,182
Int. Cl. A63b 57/00
U.S. Cl. 273—162 E **2 Claims**



This invention relates to a cup-like device having drain openings therein which is made as a unitary structure by injection molding of a flexible elastic plastic such as low-density polyethylene, polyvinyl chloride (PVC), or the like. The cup may readily be secured to, or removed from, a golf club head without the use of tools and when so secured may be used to

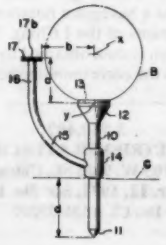
retrieve golf balls from relatively inaccessible locations or to pick up golf balls after a practice session. Attachment and removal of the cup from the golf club is accomplished by insertion or removal of the club shaft by deflecting a flexible portion of a clip member integral with the cup and then moving the clip and cup along the shaft into engagement with or detachment from the golf club head.

3,749,408
GOLF PUTTER
Stephen D. Mills, 2196 Merrimont Dr., Troy, Ohio
Filed Sept. 13, 1971, Ser. No. 179,877
Int. Cl. A63b *53/04*
U.S. Cl. 273—171 **3 Claims**



A golf putter comprises a head of hard metal having a face, walls extending rearwardly from the face surrounding a cavity in the head, and an adjustable weight such as lead tape with an adhesive backing is secured into the cavity. A removable cover plate extends across the back of the head closing the cavity and containing the weight. The cover plate also provides a surface for inscription of the owner's name. A hosel is fastened to the head and in turn is secured to the shaft.

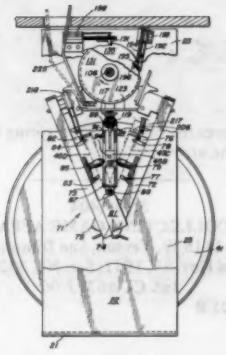
3,749,409
GOLF TEE
Louis E. Redmon, Rt. 1, Roscommon, Mich.
Filed Oct. 2, 1972, Ser. No. 293,807
Int. Cl. A63b *69/36, 57/00*
U.S. Cl. 273—183 A **8 Claims**



A molded synthetic golf tee which can be used as a training aid or in actual play, and which provides a flexible arm molded integrally with the usual shank which is inserted into the ground and has a ball cup on its upper end. The arm extends from the shank a spaced distance upwardly above the ball cup to dispose a target at the upper end of the arm at ball level, a spaced distance laterally slightly more than the radius of a regulation ball from the center of the ball cup.

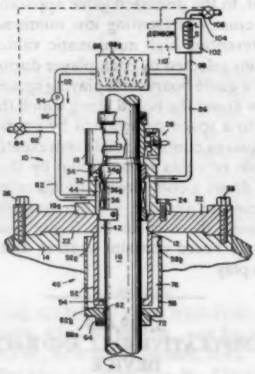
3,749,410
AUTOMATED CHANGER-PLAYER FOR MAGNETIC TAPE CARTRIDGE RECORDINGS
John A. Britz, 7803 Courtland Ave., Elmwood Park, Ill.
Filed Apr. 13, 1970, Ser. No. 27,886
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 F **5 Claims**

An automated changer-player for magnetic tape cartridge recordings in which a plurality of cartridges are stored in a rotary drum storage magazine having a stepping drive to advance the cartridges, one-by-one, to a transfer position. A transfer mechanism transfers a cartridge along a path parallel to the drum axis to an intermediate position in a tape play mechanism that includes two tape decks arranged in V-shaped configuration on opposite sides of the intermediate position.



The cartridge is shifted angularly, first to one tape deck and then to the other, to play both sides of the tape, and then is returned to the intermediate position and transferred back to the storage drum. A sequential electrical control for the changer-player includes a selector to select tapes for playing on an individual basis, with provision for skipping empty tape positions in the drum.

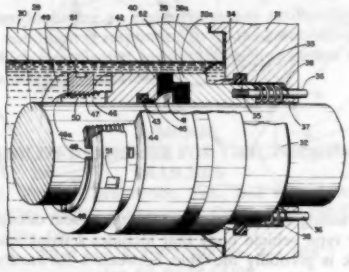
3,749,411
SHAFT SEALING SYSTEM
John J. Lennon, Winchester, Mass., assignor to Nettco Corporation, Everett, Mass.
Filed July 19, 1971, Ser. No. 163,824
Int. Cl. F16j *15/34, 15/40*
U.S. Cl. 277—2 **5 Claims**



A shaft sealing system employs a conventional liquid barrier unit to prevent leakage of gases between the shaft and its support. The system also includes a chamber positioned above the

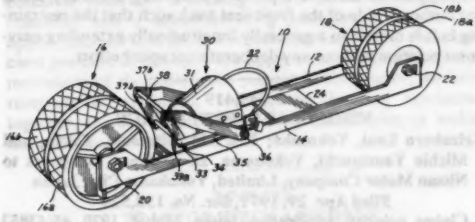
unit and communicating with it. When the unit is filled with barrier liquid, the liquid level in the chamber is at an upper location thereon. However, when the liquid supply in the unit is depleted, the level in the chamber drops appreciably indicating a gas leak in the sealing system.

3,749,412
MECHANICAL SHAFT SEAL
Ronald Lingley, One Continental Ct., Woburn, Mass.
Filed May 10, 1972, Ser. No. 252,032
Int. Cl. F16j *15/34*
U.S. Cl. 277—81 R **15 Claims**



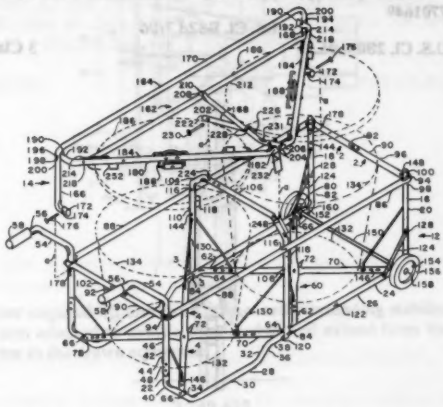
Rotary seal ring-stationary seal sleeve apparatus for frictionally sealing fluid filled, rotary shaft devices. A rigidly positioned, right-angular, alignment-holding rotary seal ring. Quick clamp-release means for positioning and locking the seal without shaft end wear or seal ring misalignment.

3,749,413
WHEELED SKI
John G. Nicolson, 1919 E. Cornell Ave., Denver, Colo.
Filed Mar. 3, 1972, Ser. No. 231,579
Int. Cl. A63c *17/14*
U.S. Cl. 280—11.2 **10 Claims**



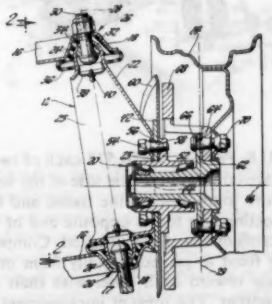
A dry land ski assembly, having forward and rear wheels, includes a foot harness assembly pivotal by body action of the user from a free wheeling to a restricted rotation position for the front wheels.

3,749,414
REFUSE CAN HOLDER
James D. Lynn, 2106 Maysville Rd., Huntsville, Ala.
Filed Jan. 10, 1972, Ser. No. 216,580
Int. Cl. B62b *1/22*
U.S. Cl. 280—47.19 **2 Claims**



A refuse can holder of generally wheelbarrow-like construction and having a lid retainer assembly for applying and removing lids and holding the lids in a lowered position to the side of the frame of the holder.

3,749,415
STEERING KNUCKLE ASSEMBLY
Peter M. Sampatacos, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed June 21, 1971, Ser. No. 154,814
Int. Cl. B62d *7/08, 7/20*
U.S. Cl. 280—96.1 **3 Claims**



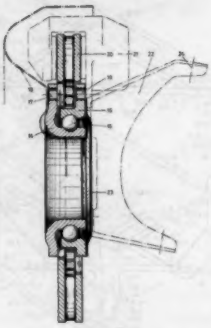
A steering knuckle assembly includes a symmetrical wheel support bracket and a symmetrical steering member which are juxtaposed in different relationships to provide a right-hand and a left-hand configuration. In one embodiment, the wheel support bracket includes integral drawn cup portions forming a part of the ball joints which pivotally mount the steering knuckle to the suspension control arms.

3,749,416

WHEEL SUPPORT FOR AN ENGINE PROPELLED ROAD VEHICLE

Sture Lennart Asberg, Savedalen, Sweden, assignor to SKF Industrial Trading and Developing Company N.V., Amsterdam, Netherlands

Filed Feb. 3, 1971, Ser. No. 112,286
Claims priority, application Netherlands, Feb. 2, 1970, 7001649
Int. Cl. B62d 7/06
U.S. Cl. 280—96.1 3 Claims



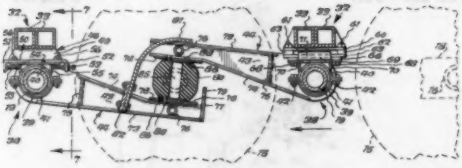
A preassembled wheel support unit having inner and outer annular members with confronting raceways for relative rotation and means for connecting one annular member to the vehicle and the other annular member to the wheel and brake disk. The pitch diameter of the raceways is at least twice the overall axial width of the annular members whereby forces resulting from functioning of the brake are acting at substantially the same diameter and close to forces from the wheel and reaction forces from the vehicle.

3,749,417

TANDEM WHEEL VEHICLE SPRING SUSPENSION

Albert F. Hickman, 8009 N. State Rd., Eden, N.Y.

Filed Sept. 21, 1971, Ser. No. 182,362
Int. Cl. B60g 25/00
U.S. Cl. 280—104.5 R 3 Claims



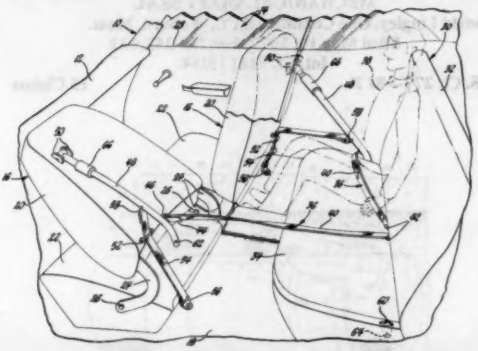
As in my U.S. Pat. No. 3,410,573 each of two or more tandem wheels are connected to one side of the vehicle frame by a hub structure journalled on the frame and having a fixed, radially projecting arm to the opposite end of which the corresponding tandem wheel is journalled. Compensating levers are severally fixed to project radially from these hub structures generally toward each other with their ends arranged above one another. The present improvement resides in the movement of these ends toward one another in response to increasing load, so that a simple spring therebetween provides substantially the entire resilient support for the frame on the wheels. Also the other end of the compensating lever for the front tandem wheel is arranged below the companion end of the compensating lever for the rear tandem wheel, so that in the event of spring failure such other ends of the compensating levers merely come together and there is no tendency for one to dig into the highway. By the addition of a short double-ended compensating lever and an additional hub structure, stub axle and wheel arm, the invention can be embodied in a self steering triple tandem wheel suspension using most of the parts of the two tandem wheel suspension.

3,749,418

VEHICLE OCCUPANT RESTRAINING BELT ARRANGEMENT

Richard E. Fancy, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 27, 1971, Ser. No. 183,871
Int. Cl. B60r 21/10
U.S. Cl. 280—150 SB 7 Claims



A restraining belt arrangement for a rear seat occupant of a two door type vehicle body that includes a front seat whose seat back is pivotally movable between a forwardly tipped easy-enter position and a generally vertical seating position. An elongated support member has a first end pivoted to the rear side of the front seat back and a second end attaching the outboard end of a restraining belt whose inboard end is secured to the vehicle body adjacent an inboard portion of the rear seat. During rearward pivotal movement of the front seat back to the seating position, a spring pivots the support member to a rearwardly extending position where the second end of the support member engages an outboard vehicle body portion and disposes the restraining belt in a generally laterally extending rear occupant restraining position without any deliberate effort on the part of the occupant. A latch mechanism on the support member includes a retractable bolt selectively engageable with the outboard vehicle body portion such that the support member secures the restraining belt in the restraining position while concomitantly positioning and supporting the front seat back in the seating position. Upon unlatching of the latch mechanism and subsequent forward pivotal movement of the front seat back toward the easy-enter position, a control belt extending between the support member and the vehicle body slides through a front seat back mounted slide member that is spaced from the pivotal axis of the front seat back. As the control belt slides relative to the front seat back, it acts against the bias of the spring and moves the support member to a position extending generally along the outboard side of the front seat back such that the restraining belt is moved to a generally longitudinally extending easy-enter position without any deliberate occupant effort.

3,749,419

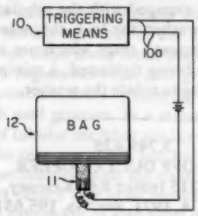
VEHICULAR SAFETY DEVICE

Keizaburo Usui, Yokosuka; Ken'Ichi Mitsuashi, Tokyo, and Michio Yamaguchi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 29, 1971, Ser. No. 138,529
Claims priority, application Japan, May 4, 1970, 45/43853
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 8 Claims

An improved vehicular safety device is disclosed which is adapted to protect a vehicle occupant or a pedestrian from injury in the event of a collision of a motor vehicle. The safety device includes an inflatable confinement or a protector bag which is arranged to be rapidly expanded to a protective position immediately when the collision is encountered by the

motor vehicle. The protector bag is expanded with a pressurized gas which is supplied from a pressurized gas generator which is closed by a rupturable sealing member. The sealing member is torn apart to open the gas generator by means of a



mechanism including an explosive means activated when the collision condition is responded to by the safety device and a piston which is projected against the sealing means when the explosive means is activated.

3,749,420

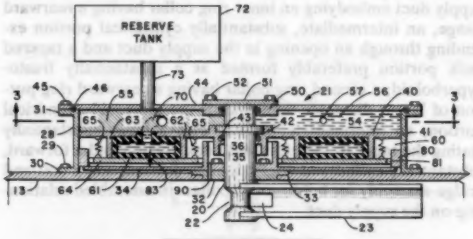
STABILIZED COUPLER FOR TRACTOR DRAWN TRAILERS

Wade M. Johnson, Huntsville, Tex., and Robert A. Ruckle, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 5, 1972, Ser. No. 241,184

Int. Cl. B62d *53/08*

U.S. Cl. 280—432 **6 Claims**



An anti-jackknifing mechanism which has a first reservoir filled with hydraulic fluid, a partition in the reservoir, and a kingpin axially mounted through the reservoir having a paddle attached to the kingpin in the reservoir. The kingpin is connected to the tractor used in hauling the trailer. The anti-jackknifing mechanism is improved by providing a lower expandable reservoir, a braking system below the expandable reservoir, and a communicating passageway between the upper reservoir and the lower reservoir such that, when sufficient pressure builds up in the upper reservoir caused by rapid movement of the trailer with respect to the tractor, the lower reservoir is expanded, forcing the braking mechanism together, thereby severely restricting the rotation or locking the trailer to the tractor.

3,749,421

TRACTOR HITCH ASSEMBLY

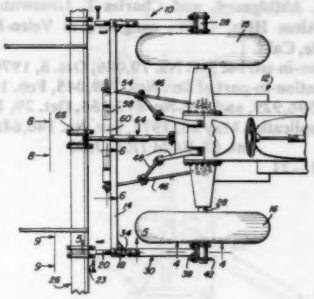
Elbert M. Rudd, Box 222, Eunice, N. Mex.

Filed Nov. 11, 1971, Ser. No. 197,654

Int. Cl. B62d *53/00*

U.S. Cl. 280—461 A **6 Claims**

An elongated drawbar carried in trailing relation to a tractor through a pair of pull arms pivotally engaged with the opposed ends of the drawbar and rotatably affixed to the rear drive axle of a tractor. The drawbar is stabilized by a pair of



tractor engaged lift arms and a rearwardly extending stabilizing arm adapted to overlie the drawbar and extend from the tractor to the drawn equipment.

3,749,422

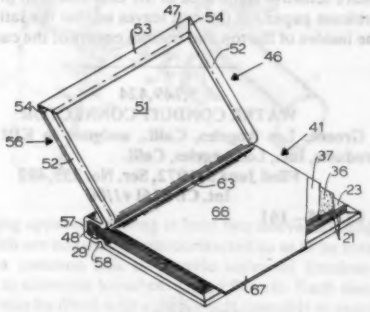
PRESSURE SENSITIVE END SHEET FOR CASING BOOKS

William H. Abildgaard, and Charles T. Groswith, III, Los Altos Hills, Calif., assignors to Velco-Bind, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 146,648, May 25, 1971, which is a continuation-in-part of Ser. No. 79,086, Sept. 8, 1970. This application Sept. 12, 1971, Ser. No. 179,967

Int. Cl. B42d *3/00*

U.S. Cl. 281—21 **11 Claims**



An uncased book is provided with identical front and back end leaves each coated on most, but preferably not all, of its outward facing surface with pressure sensitive adhesive initially protected with release paper. The uncased book is positioned relative to the case, and the spine of the uncased book is preferably attached to the spine binding of the case. The release paper is stripped from the pressure sensitive adhesive, causing each end leaf to adhere to the inside of the facing cover of the case. In a preferred embodiment, the release paper is provided with a tab which extends back beyond the inside edge of the book so that it can be gripped and the release paper stripped while the cover is closed. The book itself may be fabricated in various ways and the end leaves may be attached to the uncased book in various ways. The manner of application of the pressure sensitive adhesive to the end leaves is also subjected to variation.

3,749,423

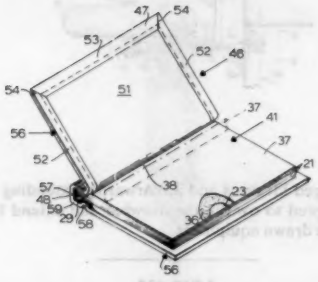
PRESSURE SENSITIVE END SHEETS FOR UNCASED BOOKS AND METHOD AND APPARATUS FOR CASING BOOKS

William H. Abildgaard, and Charles T. Groswith, III, both of Los Altos Hills, Calif., assignors to Velco-Bind, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 79,086, Oct. 8, 1970, which is a continuation-in-part of Ser. Nos. 799,045, Feb. 13, 1969, Pat. No. 3,596,929, and Ser. No. 872,134, Oct. 29, 1969. This application May 25, 1971, Ser. No. 146,648

Int. Cl. B42d 1/00, 3/00

U.S. Cl. 281—21 20 Claims



An uncased book is provided with end leaves preferably having pressure sensitive adhesive initially protected with release paper which is fabricated in various alternate ways to facilitate stripping off the release paper. The case for the book has a strip of pressure sensitive coated material at the spine area. Apparatus used to case the book has a table on which the case is positioned inside up and means for centering the case relative to the table. The uncased book is placed in a clamp pivoted to the table, the clamp being adjustable for thickness of the book. The method consists in pivoting the clamp to bring the spine edge of the uncased book into contact with the pressure sensitive spine area of the case and then to strip away the release paper for the end leaves so that the latter adheres to the insides of the top and bottom covers of the case.

3,749,424

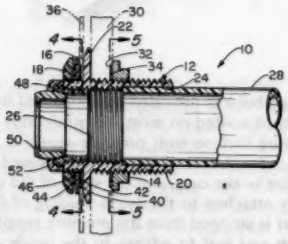
WATER CONDUIT CONNECTOR

Nat Greene, Los Angeles, Calif., assignor to KDI American Products, Inc., Los Angeles, Calif.

Filed June 5, 1972, Ser. No. 259,482

Int. Cl. F16l 41/00

U.S. Cl. 285—161 8 Claims



A water conduit connector which is particularly adapted to connect a water conduit to the wall of a swimming pool in a water-tight manner, the swimming pool being formed of an outer rigid sheet material layer and an interior plastic water-tight layer, the connector including a cylindrical tubular member extending through an opening through both of the interior layer and the outer layer, an annular collar extending from the tubular member and located between the interior layer and the outer layer, a washer to surround the tubular member and adapted to come into contact with the interior layer and frictionally bind such to the annular collar, the washer including a plurality of spaced apart radial ridges to resist rotational movement between the washer and the interior layer, a lock nut to be engaged with the tubular member and be in contact with the washer, the lock nut including a plurality of concentrically disposed rings which are to contact the washer and upon such being tightened, a minimal amount of torque is created tending to rotate the washer.

3,749,425

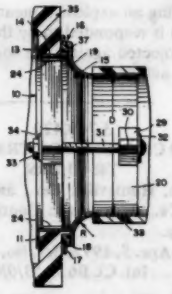
TAKE-OFF DUCT COUPLER

William R. Howland, 4215 Indian Rd., Kearney, Nebr.

Filed Nov. 4, 1971, Ser. No. 195,651

Int. Cl. F16l 5/00

U.S. Cl. 285—191 2 Claims



A coupling device for attachment of a take-off duct to an air supply duct embodying an inner ring collar having a rearward flange, an intermediate, substantially cylindrical portion extending through an opening in the supply duct and a tapered neck portion preferably formed as a substantially frusto-hyperboloid; a second ring collar having a rearward ring portion of larger diameter than that of the aforesaid cylindrical portion, an intermediate portion with a taper substantially mating the taper of the aforesaid neck portion and a forward, substantially cylindrical duct-coupling portion; and a bolt-and bridge-assembly for holding said collars in assembled relationship on the supply duct.

3,749,426

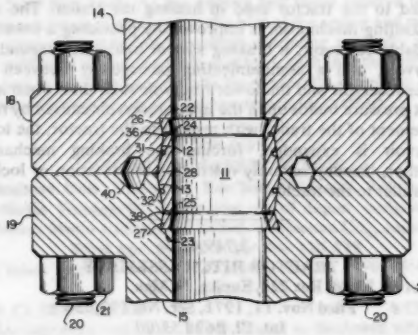
PIPE JOINT SEAL

Cassius Tillman, III, P.O. Box 343, Peters Rd., Harvey, La.

Filed July 31, 1972, Ser. No. 276,533

Int. Cl. F16l 23/00

U.S. Cl. 285—336 9 Claims



A pipe joint seal for pipes in the form of a tubular member having beveled ends is provided. The tubular member is

adapted for disposition in recesses of aligned flanged pipes connected together under stressed conditions, such as bolts, studs or clamps. Outer annular marginal grooves near the ends of the tubular members are provided to form nose sections which concentrate distortion under stressed conditions of said tubular members at the ends thereof. The annular surface of the recesses in said pipes generally conform to the exterior shape of said tubular member in the area between said marginal grooves but slope away from the exterior of said tubular member in the region between said grooves and the ends of said tubular members, thereby forming an annular shoulder in alignment with said grooves. In a stressed condition the nose sections of said tubular member are constrained to conform to the shape of the recesses above and below said shoulders. The shoulders in conjunction with the conforming shape of the tubular members retard any axial movement of the respective pipes from the expansion of said bolts or any other means due to very high temperatures. The ends of the recesses may be blunt; or, alternatively, may be beveled to conform to the shape of the beveled ends of said tubular members.

3,749,427

HIGH PRESSURE HOSE COUPLING

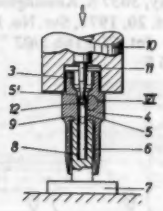
Karl Brand, Friedlandstrasse 6, 8603 Ebern, Germany

Filed Feb. 9, 1971, Ser. No. 113,839

Claims priority, application Germany, Apr. 1, 1970, P 20 15 552.6

Int. Cl. F16l *13/14*

U.S. Cl. 285—382.2 **1 Claim**



A coupling for high pressure hose in which an annular portion of an inner member is secured to a bore of an outer member along two separate circumferential regions. In the method of making the coupling the inner member is placed in a central recess in an anvil which has a frusto-conical annular upper end face that is engaged by an end wall of the outer member. A mandrel is forced into the bore of the inner member to deform its wall into engagement with the wall of the bore of the sleeve both at the end of the mandrel and at the end of the anvil.

3,749,428

UNIVERSAL PITCH, HINGED CLAMP ROOF SUPPORT

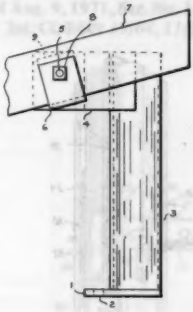
Ralph L. Hustead, R. D. No. 2, Box 127, Uniontown, Pa.

Filed Aug. 9, 1971, Ser. No. 170,197

Int. Cl. F16b *7/00*

U.S. Cl. 287—20.95 **2 Claims**

The invention comprises a device for hingedly supporting rafters adjacent the top of a post. The device permits the rafters to be inclined and clamped at a desired angle relative to



the post. A single bolt clamps the rafters to the support means and also acts as a hinge pin.

3,749,429

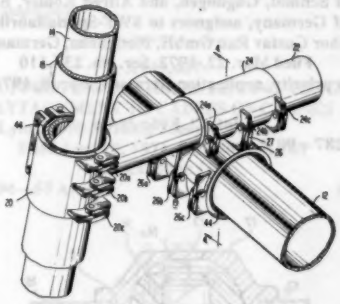
UNIVERSAL OFFSHORE PIPELINE RISER CLAMP ASSEMBLY

Ferdinand R. Hauber, Galina Park, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 816,511, April 16, 1969. This application Sept. 22, 1970, Ser. No. 74,443

Int. Cl. F16b *7/00*

U.S. Cl. 287—54 A **2 Claims**



A clamping apparatus having at least two sleeve-like hinged clamps which are adjustably interconnected so as to be rotatable about a common axis to provide universal freedom of movement to elements loosely clamped therein. Each sleeve-like clamp may be fitted with a toggle bolt assembly to provide ease in securing, releasing and adjusting the clamped elements. The surface of the clamps which contact the clamped elements may be lined with an electrical insulating material.

3,749,430

LOCK ASSEMBLY FOR HOLDING EXTENSIBLE OUTRIGGER LEG IN RETRACTED POSITION

Robert B. Jenkins, Overland Park, Kans., assignor to A. B. Chance Company, Centralia, Mo.

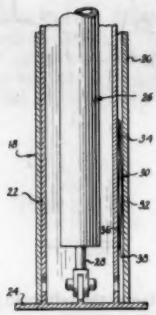
Filed Dec. 21, 1970, Ser. No. 99,993

Int. Cl. F16b *7/10*

U.S. Cl. 287—58 CT **2 Claims**

An extensible outrigger for vehicles having a power-actuated inner member shiftable within an outer member to a ground-engaging position is provided with a lock to releasably hold the inner member during over-the-road travel and storage. The lock includes a flexible plate secured to the inner member near the outer end of the latter and a compressible

pad carried by the plate between the latter and the inner member. The arrangement is such as to not only provide a wedging action but a holding effect because of the compressi-



bility of the pad. Undue wear is avoided by location of the lock so as to become effective only as the retracted position of the outrigger is approached.

3,749,431

UNIVERSAL JOINT CONSTRUCTION

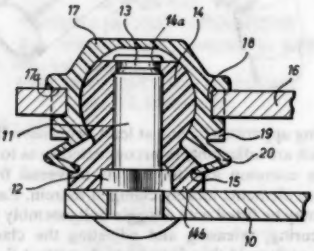
Eckhardt Schmid, Guglingen, and Alfred Kohler, Bietigheim, both of Germany, assignors to SWF-Spezialfabrik Fur Autozubehor Gustav Rau GmbH, Bietigheim, Germany

Filed Mar. 22, 1972, Ser. No. 237,110

Claims priority, application Germany, Apr. 8, 1971, P 71 13 623.7

Int. Cl. F16c *11/06*

U.S. Cl. 287—90 R **2 Claims**



A universal joint includes a socket preferably of a polyurethane plastic material having an exterior surface with an annular groove which is engaged into a slot of a receiving rod with the surface of the rod bounding the slot being engaged in the groove and with the socket being held against rotation by the projection of a web element into a recess of the groove. The joint includes a ball member carried on a pin of a lever or drive crank and which is advantageously formed of a polyurethane plastic and which is held on the pin against rotation by a hexagonal collar portion of the pin and held gainst removal by a snap-fit of a bead portion into a groove defined on the pin. The socket also includes a bellows-like lower extension which extends downwardly over the base of the ball member and engages into an annular groove of the ball member.

3,749,432

DOUBLE-WALLED PARTITION AND PARTITION ELEMENTS

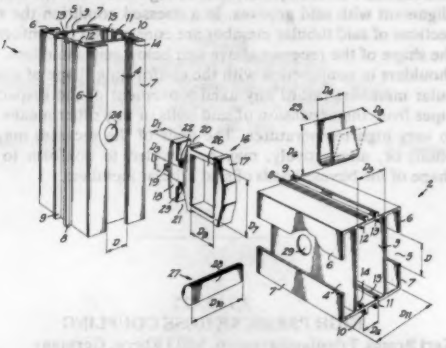
Leopold Mathieu Lambert Janssen, 28, rue de l'Ancien Chateau, Herseaux, Belgium

Filed May 3, 1972, Ser. No. 250,003

Claims priority, application Belgium, May 12, 1971, 767043

Int. Cl. E04b *2/74, 2/60*

U.S. Cl. 287—189.36 A **8 Claims**



The invention pertains to partitions comprising a strengthening structure consisting of an assembly of uprights and crosspieces made of extruded box-like sections of metal or a light alloy. The spaces defined by said assembly are provided with opaque, translucent or transparent panels in any suitable material.

3,749,433

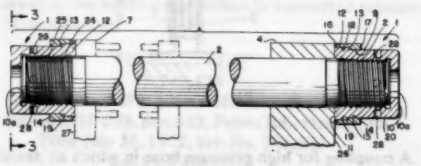
LOCK NUT ASSEMBLIES

Vincent J. Mankowsky, 3037 S. Kensington, Westchester, Ill.

Filed Oct. 20, 1971, Ser. No. 190,793

Int. Cl. F16b *5/02*

U.S. Cl. 287—189.36 F **5 Claims**



A lock nut assembly having a nut abuttingly engageable with a stationary member, and a clamping member securable to the stationary member in position to clamp the nut in such abutting engagement with the stationary member. When the assembly is applied to both of the threaded ends of a tie rod it effectively prevents rotation or twisting of the tie rod.

3,749,434

HOOD LATCH

Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt, Inc., Milwaukee, Wis.

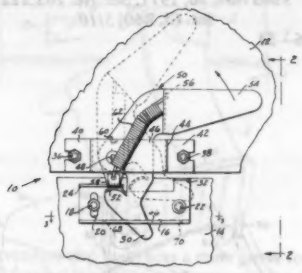
Filed Sept. 27, 1971, Ser. No. 184,019

Int. Cl. E05c *3/04*

U.S. Cl. 292—128 **2 Claims**

An improved hood latch for releasably securing a hood or the like to a frame in which an over center spring releasably holds a pivoted unitary latch and handle member alternatively in a first position at which a latch snaps into engagement with a strike on the frame as the hood is closed on the frame and a

second position to which the member is manually moved to position the latch element clear of the strike in combination



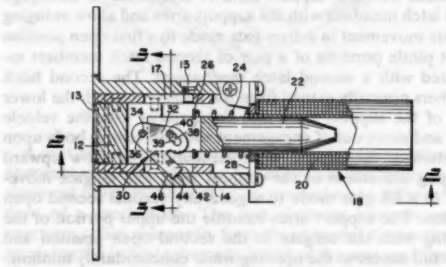
with interengageable means on the member and on the frame for restoring the member to its first position as the hood is moved away from the frame.

3,749,435

ELECTRIC STRIKE

Alfiero F. Balzano, Anaheim, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 21, 1971, Ser. No. 145,672
Int. Cl. E05c *11/00*
U.S. Cl. 292—341.16 **11 Claims**



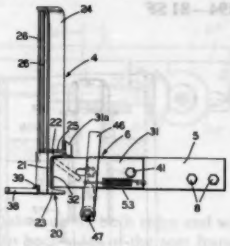
An electrically operated strike for coacting with a bolt of a door lock includes a casing adapted to be mounted on a door frame and a bolt member slidable between a projected position engaging the door lock bolt, and a retracted position. Spring means are provided for biasing the bolt member toward the projected position and a solenoid is provided for effecting movement of the bolt member against the biasing effect of the spring to its retracted position. Dogging means are interconnected between the solenoid and the bolt member and have a dogging position holding the bolt member in its projected position when the solenoid is not energized and a release position providing for movement of the bolt member to its retracted position when the solenoid is energized. The dogging means is operable when in its dogging position to transfer external forces applied to the bolt member to the casing to thereby render the external forces ineffective to move the bolt member toward its retracted position.

3,749,436

TRACTOR BUMPER CONSTRUCTION

Delbert Hitchcock, Wooster, Ohio, assignor to H & H Manufacturing Company, Wooster, Ohio

Filed Aug. 9, 1971, Ser. No. 170,198
Int. Cl. B60r *19/04, 11/00*
U.S. Cl. 293—73 **1 Claim**



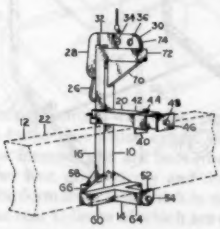
A tractor bumper for attachment to the front end of a tractor. The bumper has a pivotally mounted frame assembly movable from a vertical to a horizontal position. Mounting plates are attached to each end of the frame assembly and extend perpendicularly and rearwardly therefrom and are pivotally attached to a pair of horizontal tractor mounting brackets. A spring biased lever having a projecting pin is movably mounted on each of the mounting plates. The pins extend into slots formed in the mounting brackets to latch the frame assembly in vertical position. A boss projects from the frame assembly to hold the frame assembly in horizontal position. Vertical grill posts form openings in the frame assembly in which ballast weights may be positioned and mounted on the frame assembly.

3,749,437

BEAM SUPPORTING DEVICE AS LIFTING TONGS, FOR ATTACHMENT TO CABLES OF CRANES

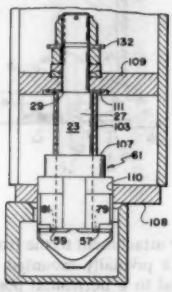
Buddy E. Lynn, 4208 N. 35th, Tacoma, Wash.

Filed Aug. 19, 1971, Ser. No. 173,147
Int. Cl. B66c *1/26*
U.S. Cl. 294—67 AA **5 Claims**



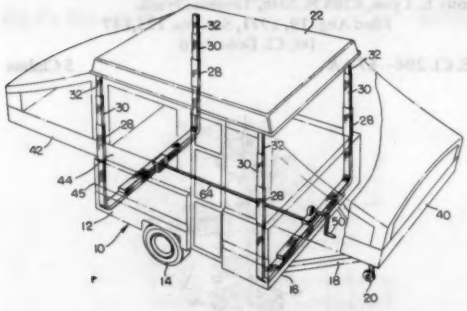
Lifting tongs are a device to firmly grasp a structural beam, etc., without marring it, as a crane is operated, with its cable attached to the lifting tongs directly or to a spreader bar that spaces and holds two or more lifting tongs, to lift the beam to its overhead installation locale. Thereafter, a slight lowering and a slight raising of the lifting tongs readjusts their grasping members to clear the structural beam, without crane operating personnel and/or riggers going above to the installed beam to remove the lifting tongs. Essentially, this is done as the top transverse member of the lifting tongs is readjusted relative to the bottom transverse member. The top of the installed beam maintains the elevation of the top transverse member as the remainder of the lifting tong components are slightly lowered until a latch grasps the top transverse member in a greater spaced apart position of the lifting tong components.

3,749,438
TWIST LOCK
Robert Jewelle Loomis, Piedmont, and Chester William Rensink, Castro Valley, both of Calif., assignors to Fruehauf Corporation, Alameda, Calif.
Filed Apr. 5, 1971, Ser. No. 131,247
Int. Cl. B66c 1/42
U.S. Cl. 294—81 SF 17 Claims



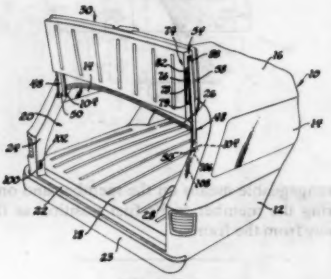
A twist lock for use with lifting beams for handling different kinds of cargo containers.

3,749,439
DEVICE FOR RAISING AND LOWERING THE TOPS OF CONVERTIBLE RECREATIONAL VEHICLES
Robert E. Ferguson, Middlebury, Ind., assignor to Coachmen Industries, Inc., Middlebury, Ind.
Filed June 21, 1971, Ser. No. 154,743
Int. Cl. B60p 3/34
U.S. Cl. 296—26 6 Claims



A lifting mechanism for the tops of recreational vehicles, such as campers and the like, consists of two pairs of adjustable telescoping members connected to the four corners of the top. Tracks, having horizontal and vertical sections with interconnecting radius sections, have lifting elements slidably received in the tracks and are mechanically moved within the tracks to exert expanding movement on the telescoping elements and therefore lifting movement on the top. The elements consist of plastic or other composition members which are connected in series to each other by flexible connections which permit them to turn through a radius from horizontal to vertical track sections, and also transmit along their length the lifting force exerted manually at one part of the system. Thereby lifting force is communicated evenly to each of the four corners of the top while it is being raised and lowered. There is no possibility for jamming or misalignment and the product is easily constructed and maintained.

3,749,440
TAILGATE
Michael W. Lathers, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1971, Ser. No. 202,222
Int. Cl. B60j 5/10
U.S. Cl. 296—51 5 Claims

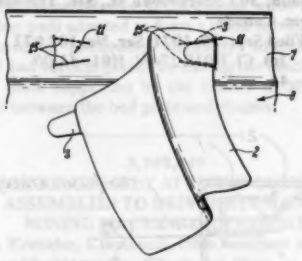


A station wagon type vehicle body includes a rear opening whose lower portion is selectively closed by a tailgate. A pair of support arms extend along the vertical edges of the opening when the tailgate is in closed position and have their upper ends pivoted to the vehicle body for swinging movement about a transverse vehicle body axis substantially midway between the upper edge of the opening and the upper edge of the closed tailgate. A first latch mechanism including a pair of first latch members normally extending from the tailgate into engagement with the support arms is actuatable to disengage these latch members with the support arms and allow swinging tailgate movement in a drop-gate mode to a first open position about pintle portions of a pair of second latch members associated with a second latch mechanism. The second latch members normally extend from the tailgate through the lower ends of the support arms into engagement with the vehicle body and move out of engagement with the vehicle body upon actuation of the second latch mechanism to allow upward swinging movement of the support arms and tailgate movement in a lift-gate mode to a generally vertical second open position. The support arms straddle the upper portion of the opening with the tailgate in the second open position and allow full access to the opening while concomitantly minimizing the distance the tailgate extends outwardly of the adjacent vehicle body confines. Linkages connecting an actuator handle to the latch mechanisms include lost motion connections such that the handle is moved in opposite directions to selectively actuate either latch mechanism.

3,749,441
SHEET MATERIAL ATTACHING MEANS
Rodney James Bini, Rosanna, Victoria, Australia, assignor to George Norman & Co. Pty. Ltd., Victoria, Australia
Filed July 13, 1971, Ser. No. 162,137
Claims priority, application Australia, July 28, 1970, 2003
Int. Cl. A47c 7/36
U.S. Cl. 297—223 8 Claims

A protector member for releasable attachment to seats, having a flexible body section adapted to overlie part of the seat to guard it against soiling, and a relative rigid tab element extending from an edge of the body section and being slidably

receivable within a pocket formed in the seat covering so as to form the attachment between the protector member and the



seat. The invention also embraces a main cover for a seat having a pocket formed therein to cooperate with an attaching tab of a protector member.

3,749,442

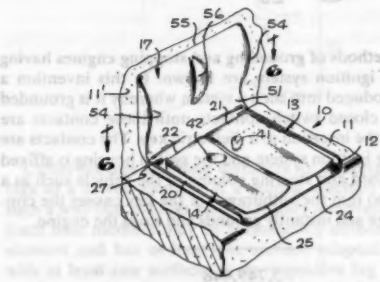
SEAT HAVING RELATIVELY ADJUSTABLE SECTIONS

Joseph A. Berg, 18670 Ventura Blvd., Tarzana, Calif., and Loren W. Eames, 4233 N. Rick Rd., El Monte, Calif.

Filed Aug. 30, 1971, Ser. No. 175,821

Int. Cl. A47c *1/034*; B60n *1/02*

U.S. Cl. 297—312 **15 Claims**



A seat assembly having a base and two complementary seat elements supported thereon for individual yieldingly resisted universal tilting movement to accommodate to different positions of a user's body. The seat elements have recesses or apertures offset rearwardly from the universal connections for receiving the ischial tuberosity bones of the user, and the back of the seat has a localized recess for partial reception of the lumbar portion of the user's backbone. A peripheral upturned flange may be provided on the base in a relation enabling use of the assembly as a portable unit, to be removably positioned on a chair or the like, with the shiftable seat elements then being held by the flange against interfering contact with the chair. At the forward edges of the two shiftable seat elements, the assembly may be constructed to provide a more cushioned or yielding support than at other locations.

3,749,443

MECHANISM FOR ADJUSTING AND LOCKING THE BACK REST OF A SEAT

Werner Strien, Stuttgart-Heumaden; Eberhard Faust, Stuttgart-Degerloch, and Jurgen Walz, Stuttgart-N, all of Germany, assignors to Keiper, Fritz KG, Stuttgart, Germany

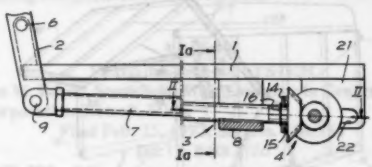
Filed June 28, 1971, Ser. No. 157,532

Claims priority, application Germany, July 2, 1970, P 20 32 833.0

Int. Cl. A47c *1/025*

U.S. Cl. 297—362 **9 Claims**

A mechanism for effecting coarse as well as fine adjustments of the inclination of the back rest of a seat and for locking and bracing the back rest on both sides in the adjusted position by the manipulation of a single hand wheel, whereby any forces which might be exerted upon one side of the back



rest will be uniformly taken up by both sides and will also be uniformly transmitted to both sides of the seat frame without causing any permanent distortions of the back rest or seat frame.

3,749,444

SITTING FURNITURE

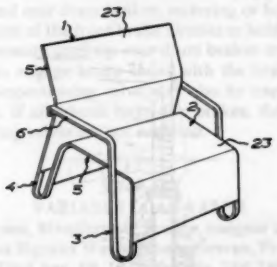
Eric Sigfrid Persson, Horby, and Signe Harriet Persson-Melin, Malmo, both of Sweden, assignors to Expo Nord, AB, Horby, Sweden

Filed Nov. 30, 1971, Ser. No. 203,321

Claims priority, application Sweden, Feb. 11, 1971, 1706/71

Int. Cl. A47c *5/00*, *11/00*

U.S. Cl. 297—445 **9 Claims**



A piece of sitting furniture with back rest and seat members has two lateral frame bars which extend each along one side edge of the seat member and are bent from the front end of the seat member first downwardly and then rearwardly and upwardly so as to form front legs which in side elevation are of U-shape and the rear U-limbs of which are extended in an upward direction past the seat member and bent rearwardly so as to form an arm rest portion.

3,749,445

DUMP BOX FOR CHAFF AND THE LIKE

Austin Lewis Dalman, General Delivery, Stockton, Manitoba, Canada

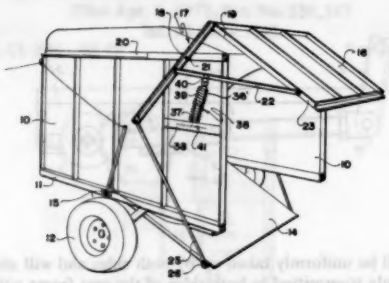
Filed May 10, 1971, Ser. No. 141,583

Int. Cl. B60p *1/00*

U.S. Cl. 298—26 **8 Claims**

A combination floor and tail-gate assembly opens when unlatched due to the weight of the load thereon and closes when the load is discharged. A combination spring piston and cylinder assembly extends between the linkage to the tail-gate and the frame and compresses during the first part of the opening thus storing energy until it moves over center whereupon it controls the speed of the final opening. When closing,

the reverse action takes place and by adjusting the connection of the cylinder to the frame, this speed of opening and closing



can be controlled to suit the load on the floor. It also eliminates the need for latches to hold the floor open.

3,749,446

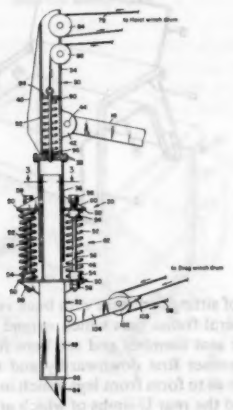
TRENCHING MACHINE

John T. Doty, 2238 E. 21st St., Long Beach, Calif.

Filed Aug. 25, 1971, Ser. No. 174,705

Int. Cl. E02d 17/13

U.S. Cl. 299—37 **9 Claims**



A trenching machine having a vertically swinging boom pivotally mounting a weighted trenching stick with lower trenching teeth and operating means for selectively swinging the boom vertically and the trenching stick horizontally relative to the boom to excavate a trench and releasing the boom and trenching stick to drop freely from an elevated position to fragment hard material encountered in the trenching operation. The trenching stick has telescoping members interconnected by energy absorbing means which isolate from the boom the shock forces produced by the impact of the stick with the ground and cushion relative rebound movement of the members following impact. The boom is raised and released to drop by a winch including a cable having a dead end anchored to the machine by a spring which yields to permit braking of the winch drum after each impact without danger of parting or spilling the cable.

3,749,447

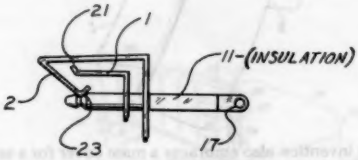
VEHICLE SAFETY SWITCH WITH REMOVABLE DIELECTRIC PLUG

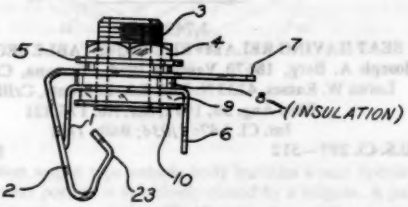
Richard Renaud, 303 Sherbrooke St., Ste. Therese de Blainville, Quebec, Canada

Filed Sept. 20, 1971, Ser. No. 182,022

Int. Cl. H01h 27/04; H01r 33/00

U.S. Cl. 200—44 **1 Claim**





Various methods of grounding and stopping engines having an electrical ignition system are known. In this invention a device is introduced into such a system whereby it is grounded by normally closed switch contacts until these contacts are separated by the insertion of a dielectric key. The contacts are wired into the ignition system and the switch housing is affixed to the dashboard and steering column of the vehicle such as a snowmobile so that the withdrawal of the key causes the contacts to engage and instantly grounds and stops the engine.

3,749,448

ROCK BORING MACHINE WITH SWINGING HAMMERS AND STEERING

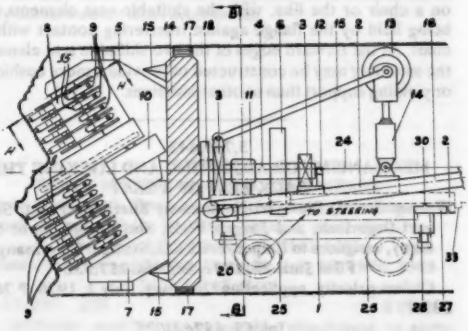
Richard Francis Taylor, Johannesburg, Transvaal Province, South Africa, assignor to Anglo-Transvaal Consolidated Investment Company Limited, Johannesburg, South Africa

Filed July 26, 1971, Ser. No. 166,022

Claims priority, application South Africa, July 31, 1970, 705310

Int. Cl. E01q 3/04

U.S. Cl. 299—62 **8 Claims**



A rock boring machine comprising a mobile chassis supporting a forwardly projecting rotatable shaft carrying at its

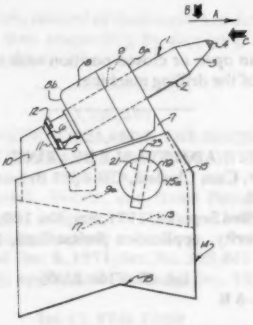
forward end a cutting head having at least one independently rotatable rotor with hammers free swinging between end stops pivoted thereto and means for angularly varying the position of the cutting head relative to the chassis while maintaining a rotor cutting path adapted to form a track for the chassis. The cutting head is preferably angularly adjustable in both horizontal and vertical planes by having the machine mounted on a bed plate supported by the chassis to allow universal movement between the bed plate and chassis.

3,749,449

MEANS FOR REMOVABLY AFFIXING CUTTER BIT AND LUG ASSEMBLIES TO DRIVEN ELEMENTS OF A MINING MACHINE OR THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Filed Oct. 13, 1971, Ser. No. 188,778
Int. Cl. E21c *35/18*
U.S. Cl. 299—93 **56 Claims**



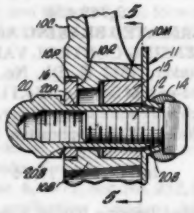
Cutter bit lugs and base members for affixing the cutter bit lugs to a driven element of a mining machine or the like in such a way that the lugs may be readily removed and replaced. Each base member may be permanently affixed to the driven element and has at least one surface adapted to cooperate with at least one surface on its respective lug to sustain the resultant cutting forces. Means are provided to maintain the lug in position on the base member, the resultant cutting forces on said maintaining means being reduced by the above mentioned cooperating surfaces.

3,749,450

WHEEL ADAPTATION MEANS

Louis Senter, and Robert E. Johnson, both of Gardena, Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 22, 1969, Ser. No. 868,315
Int. Cl. B60f *3/16*
U.S. Cl. 301—9 DN **9 Claims**



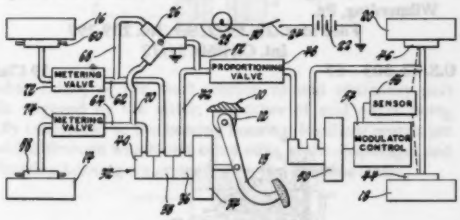
A vehicle wheel having a central hub portion defining a plurality of radially-spaced apertures extending therethrough for receiving the wheel mounting bolts of a vehicle. Each aperture is tapered at one end to receive a similarly tapered insert and may form a recess at its other end to receive a washer. Each insert and washer has, in one embodiment, an eccentrically-positioned hole so that, by appropriately adjusting the washer and insert in each aperture, the wheel can be made to fit mounting bolt patterns of different radii.

3,749,451

VEHICLE BRAKE SYSTEM

Bruce M. Edsall, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1972, Ser. No. 228,751
Int. Cl. B60t *8/10*
U.S. Cl. 303—6 C **10 Claims**



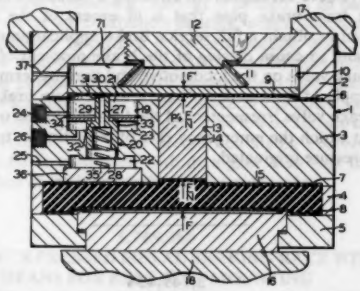
A vehicle brake system having three hydraulic circuits, one going to the two rear wheels and the other two respectively going to each of the two front wheels. A wheel lock control system is used on the rear wheels. The three circuits are actuated by a master cylinder assembly having three separate pressurizing chambers. When the vehicle is equipped with front disc brakes and rear drum brakes, metering or hold-off valves are used in each of the front brake circuits to hold off the front disc brake pressure until the rear drum brakes are sufficiently pressurized to engage brake shoes with the brake drums. A rear brake proportioning valve may also be used in the rear brake circuit. If all wheels have disc brakes, the front brake circuit metering valves are not required.

3,749,452

VARIABLE LOAD VALVE

Roger Deschenes, Montfermeil, France, assignor to Compagnie des Freins et Signaux Westinghouse, Sevran, France

Filed Apr. 19, 1972, Ser. No. 245,349
Claims priority, application France, May 10, 1972, 7116738
Int. Cl. B60t *8/22*
U.S. Cl. 303—22 R **8 Claims**



A load weighing device compressively interposable between a sprung portion and an unsprung portion of a vehicle and subjectable to a compressive force of a degree corresponding to the load condition of the vehicle. The weighing device, which is adapted for interposition in a fluid pressure circuit, includes means for converting the compressive force to a propor-

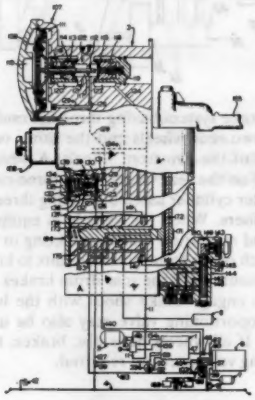
tionally reduced force and valve means operable by the reduced force for effecting transmission of a fluid pressure control signal of a degree inversely proportional to the degree of the compressive force. The weighing device may be modified to transmit a fluid pressure control signal directly proportional to the compressive force reflecting the load condition.

3,749,453

APPARATUS FOR DETECTING EMERGENCY VENTING OF BRAKE PIPE

Richard L. Wilson, Monroeville, and Robert J. Worbois, Irwin, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 29, 1972, Ser. No. 239,297
Int. Cl. B60t *11/32*
U.S. Cl. 303—67 **19 Claims**



This invention relates to locomotive brake control apparatus operable responsively to a certain pressure differential developed by a chosen rate of flow of fluid under pressure from the main fluid pressure storage reservoir on the locomotive to a train brake pipe, resulting from an emergency rate of reduction of the pressure in the train brake pipe initiated at a location in the train remote from the locomotive as a result of a ruptured or separated brake pipe occurring while effecting a brake release subsequent to effecting a reduction of pressure in the train brake pipe that is in excess of the reduction required to obtain a full service brake application on the entire train, to cause closing of the brake pipe cut-off valve of the brake valve on the locomotive and thereby termination of the supply of fluid under pressure to the train brake pipe by this brake valve irrespective of the location in the train brake pipe at which the emergency rate of reduction in train brake pipe pressure originated.

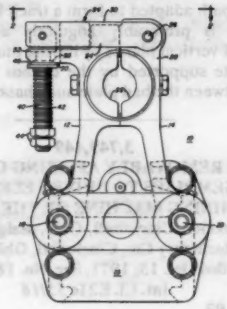
3,749,454

CENTRALIZER

Edward A. Bailey, R.D. 2, Box 37, Newport, N.H., and Robert E. Wolcott, Green Mountain Rd., Claremont, N.H.

Filed Dec. 22, 1971, Ser. No. 211,026
Int. Cl. F16c *31/00*
U.S. Cl. 308—3.9 **4 Claims**

A centralizer for firmly holding a drill steel on a track drill or similar drill rig by utilizing a latch mechanism that is easily



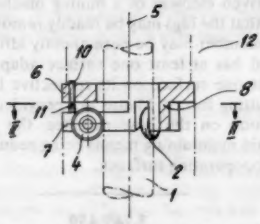
operated to an open or closed position with access thereto in any position of the drilling machine.

3,749,455

ADJUSTABLE BEARING

Johann Meier, Casa Clarissa, CH-6645 Brione Sopra Minusio, Switzerland

Filed Sept. 14, 1971, Ser. No. 180,417
Claims priority, application Switzerland, Sept. 15, 1970, 13632/70
Int. Cl. F16c *21/00*
U.S. Cl. 308—6 R **7 Claims**



An adjustable bearing for a cylindrical member includes at least two guide rollers provided with at least three points of support distributed over the circumference of the cylindrical member. One of the guide rollers is so arranged as to be tiltable in a radial plane of the bearing to a smaller diameter.

3,749,456

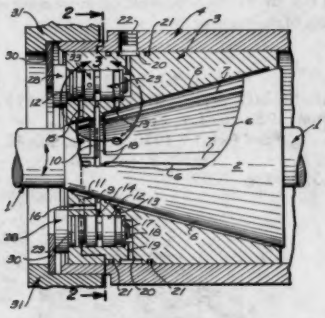
FLUID LUBRICATED BEARING AND PRESSURE SENSING CONTROL VALVE

William D. Whitaker, 1512 E. 5th, No. 30, Ontario, Calif.

Continuation-in-part of Ser. No. 754,112, Aug. 15, 1968, abandoned, which is a continuation of Ser. No. 558,748, June 20, 1966, abandoned. This application Nov. 1970, Ser. No. 91,278
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **12 Claims**

A fluid lubricated bearing having a set of fluid receiving bearing cavities, each being in communication with a control valve which senses incipient positive or negative pressure change due to incipient movement of the shaft toward or away from the cavity, then amplifies the sensed change and feeds lubricating fluid to the corresponding bearing cavity at the

pressure and rate needed to create a restoring force sufficient to minimize or prevent shaft displacement. The valve also



being adapted to the control of fluid motors to detect incipient change in load, then responding by supplying more or less motor fluid as required.

3,749,457

GUIDE BEARING FOR USE IN THE HOUSING OR BEARING PLATE OF A MACHINE OR OTHER APPARATUS

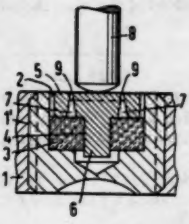
Hans Peter Latussek, Feucht, and Heinz Petrak, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 8, 1971, Ser. No. 205,841

Claims priority, application Germany, Dec. 19, 1970, G 70 46 956.6

Int. Cl. F16c *35/08*

U.S. Cl. 308—58 **3 Claims**



A guide bearing disposed in the housing, bearing bracket or like structure of a machine or other apparatus having a shaft includes a guide bearing plate mounted on the structure for supporting the shaft of the apparatus. An elastic intermediate member having an outer peripheral surface is disposed intermediate the bearing plate and the structure. The intermediate member is made of porous material and is sealed at its outer periphery. The bearing plate has a portion supported on the intermediate member and this portion is formed with capillary bores extending therethrough and communicating with the member.

3,749,458

CENTERING DEVICE FOR ROTARY SHAFT

Henric Wilhelm Thylefors, Stockholm, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

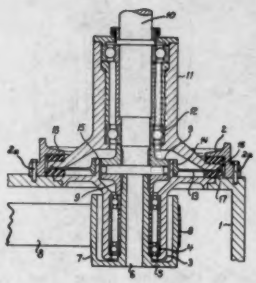
Filed Mar. 6, 1972, Ser. No. 232,169

Claims priority, application Sweden, Mar. 15, 1971, 3273/71

Int. Cl. F16c *23/04*

U.S. Cl. 308—142 **3 Claims**

The rotary shaft is journalled in a bearing housing associated with a machine frame provided with a stationary part engaging one of the inner and outer edges of a diaphragm having a central hole through which the shaft extends, the diaphragm being made of resilient material but being substantially rigid in its main plane. Said one edge of the diaphragm is



slidable axially of the shaft relative to said stationary part while engaged by the latter, the other of said edges being rigidly connected to the bearing housing. Resilient means are provided through which said other edge of the diaphragm and the bearing housing are connected to the machine frame.

3,749,459

ANTIFRICTION BEARING ASSEMBLY FOR ELECTRIC MOTORS

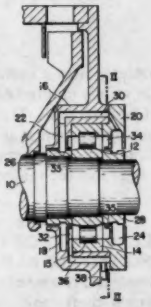
Tetuo Matuzaki; Toshio Nakamura, and Hitoshi Egawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1971, Ser. No. 200,473

Claims priority, application Japan, Dec. 2, 1970, 45/105865

Int. Cl. F16c *33/66*

U.S. Cl. 308—187 **13 Claims**



A worn grease containing chamber is formed in an outside bearing cover of an antifriction bearing, which chamber extends horizontally towards a peripheral portion thereof and opens to an axial outside portion of the antifriction bearing. The bottom portion of the worn grease containing chamber inclines towards the lowest inner surface of the outer race of the antifriction bearing. The height of the lowest surface of the bottom portion of the worn grease containing chamber is selected to be at least even with or higher than that of the lowest surface of the inner surface of the outer race.

3,749,460

TWO-PIECE PRESSED METAL BEARING RACE WITH MEANS FOR RESILIENT MOUNTING

Martin J. Hogan, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

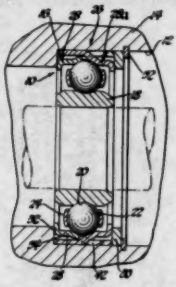
Filed May 4, 1972, Ser. No. 250,122

Int. Cl. F16c *33/60*

U.S. Cl. 308—196 **10 Claims**

A bearing race comprises two identical pressed metal pieces. Each piece includes an annulus with a curved raceway

on its inside surface and stepped segments continuous with the annulus. In assembly, the segments of each piece cross over the segments of the other piece and have portions which overlie the annulus of the other piece. The overlying portions resiliently mount the two piece bearing race on a support and allow radial movement of each annulus with respect to the support.



3,749,461

BALL-BEARING RETAINER

Donald H. Liss, Newington, and Gilbert W. Geiger, Southington, both of Conn., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 26, 1972, Ser. No. 247,595
Int. Cl. F76c *19/20*
U.S. Cl. 308—201 **8 Claims**

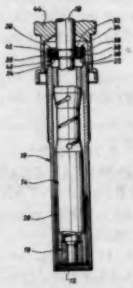
The invention contemplates a unitary ball-bearing retainer particularly suited to axially entered detent-retained reception of a complement of bearing balls. The arrangement is such as to specifically avoid ball hang-up at angular locations between pockets, thus lending the construction to more fully automated ball-bearing assembly techniques.

3,749,462

SPINDLE COLLAR STORAGE FOR SPINDLES OF SPINNING AND THREAD MACHINES

Gunther Wendel, Stuttgart, Germany, assignor to SKF Kugellagerfabriken Gesellschaft mit beschrankter Haftung, Schweinfurt, Germany

Filed July 7, 1971, Ser. No. 160,464
Int. Cl. F16c *35/08*
U.S. Cl. 308—228 **4 Claims**



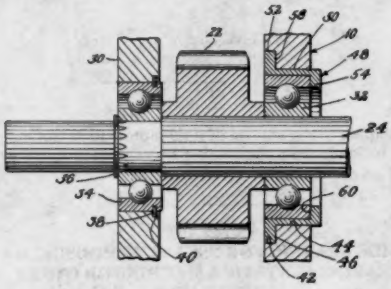
A bearing collar for the spindle of a spinning and twisting machine comprising an inner race ring fastened to the spindle and supported on the roller balls which are themselves supported on an outer race ring seated within the bearing housing. The outer and inner race rings are arranged so that the spindle is rotatably supported on insertion within the bearing housing but are axially separable on movement of the spindle outwardly of the housing.

3,749,463

BEARING MOUNTING METHOD AND APPARATUS

John Krapf, 29 Shelter Ln., Levittown, Pa.

Filed Oct. 13, 1970, Ser. No. 80,406
Int. Cl. F16c *33/00*
U.S. Cl. 308—236 **5 Claims**



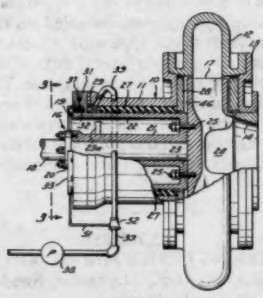
A bearing is mounted to a casing by undercutting the casing adjacent a shaft aperture to form a recessed shoulder, inserting a bearing mounting sleeve having an outer flange at one end and inner bearing retaining means at the other end into the aperture so that the flange is against the shoulder, and inserting the bearing into the sleeve against the bearing retaining means. The invention is particularly useful in repairing damaged transmissions of the type including output transfer gears.

3,749,464

LUBRICATION SYSTEM FOR BEARINGS

James Glenn Satterthwaite, Portsmouth, Va., assignor to The Johnson Rubber Company, Middlefield, Ohio

Filed Sept. 2, 1971, Ser. No. 177,334
Int. Cl. F16c *33/74*
U.S. Cl. 308—36.1 **12 Claims**



A forced lubricated bearing system is disclosed in which means are provided to recirculate lubricant leakage back to the bearing. In the illustrated embodiments, a water lubricated rubber bearing journals the shaft of a marine propulsion system or a pump. Water is pumped into the bearing for lubrication. A restricter limits the leakage rate from at least one end of the bearing. The leakage is collected and returned by

an aspirator type pump in the lubricant supply line to the bearing. An inflatable seal operates to prevent leakage when the shaft is stationary and lubricant is not supplied to the bearing. In some instances, the inflatable seal is partially inflated to restrict the rate of leakage when the shaft is moving.

3,749,465

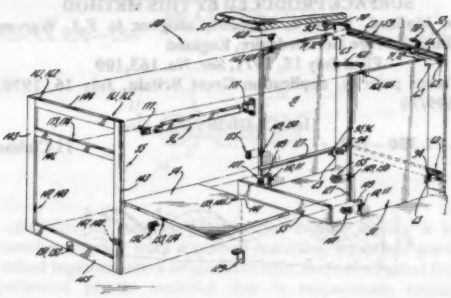
KNOCK DOWN CABINET AND HARDWARE FOR ASSEMBLING THE SAME

John I. Newcomer, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 22, 1971, Ser. No. 126,728

Int. Cl. A47b *43/00*

U.S. Cl. 312—245 **6 Claims**



The components of the cabinet are assembled to one another and attached to the wall of a room by clip-type hardware which fits partially into slots formed in the cabinet components and in rails on the wall and which is adapted to be clamped to the components and the rails.

3,749,466

ASH TRAYS FOR MOTOR VEHICLES

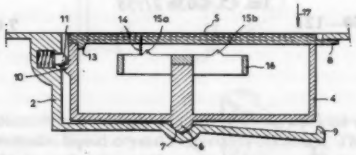
Jean Cadiou, Paris, France, assignor to S.A. Automobiles Citroen, Paris, France

Filed July 15, 1971, Ser. No. 163,026

Claims priority, application France, July 15, 1970, 7026038

Int. Cl. A47b *67/02*; A47f *5/08*

U.S. Cl. 312—245 **8 Claims**



An ash-tray, for a motor vehicle, is recessed in the dashboard of the vehicle and comprises a pivotal receptacle and a rigid, sliding, lid for closing the receptacle. Both when the receptacle is open or closed, substantially no part of the ash-tray protrudes beyond the surface of the dashboard.

3,749,467

FLUORESCENT LAMPS AND METHOD OF MANUFACTURING THE SAME

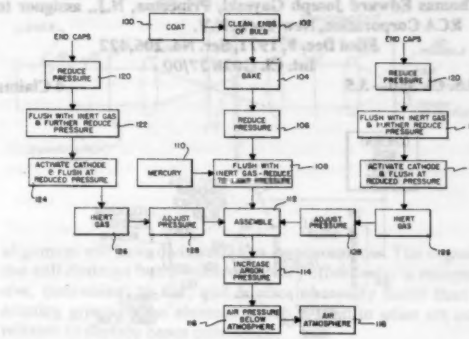
Thomas J. Emidy, Morris Plains; Donald P. Northrop, Glen Rock; Luke Thorington, Berkeley Heights, and Andrew Henry Olsen, Jersey City, all of N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Mar. 15, 1971, Ser. No. 124,311

Int. Cl. H01j *9/18*

U.S. Cl. 316—19 **19 Claims**

Fluorescent lamps which are manufactured by a process in which the lamp envelope, during one step of the process, is exhausted through both ends simultaneously thereby avoiding unnecessary contamination within the lamp envelope. In a preferred embodiment of the process, the electrodes are activated outside of the lamp and the contaminants removed to prevent them from contaminating the lamp. A lamp is also disclosed in which the end caps have electrical contact members mounted directly thereon through which the lamp is to be connected to a fixture to supply current to the lamp, and in which the mounting leads for the cathode of each end cap are connected directly to these electrical contacts. The end caps are also formed to accept an end of the envelope of a fluorescent lamp for direct attachment thereto. In a further embodiment of the invention an end cap is provided having a tubulation which can be sealed by infra-red energy.



3,749,468

APPARATUS FOR MANUFACTURING DISCHARGE LAMPS

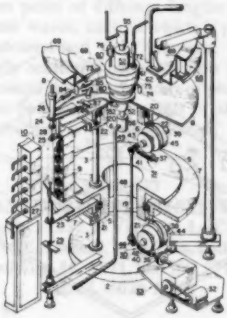
Yasuhiko Yamamoto, Kusatsu; Sugao Shimada, Otsu, and Suguru Matsuno, Kusatsu, all of Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Filed Sept. 8, 1971, Ser. No. 178,749

Claims priority, application Japan, Sept. 28, 1970, 45/4596485

Int. Cl. H01j *9/38*

U.S. Cl. 316—30 **10 Claims**



A discharge lamp manufacturing apparatus, especially for the manufacture of discharge lamps, is provided with a rotating central valve comprising an annular rotatable plate and an annular stationary plate. The valve is mounted so that the stationary plate is arranged above the rotatable plate. A cooling water tank is arranged in the space centrally of said valve. A driving system for the rotational parts employs reduction mechanisms in which the revolution of a driving device, which drives two turntables in synchronism, is transferred through a pair of cam means to each of said turntables through successively engageable pin rollers mounted on said turntables, said

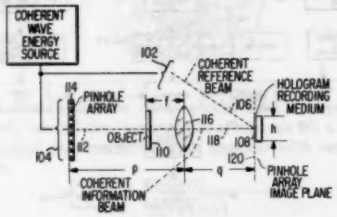
turntables carrying a plurality of spaced chucks for holding glass tube blanks. Each cam means is engaged with its curved surface by one of said pin rollers at a time whereby the turntables move intermittently and in synchronism.

3,749,469

REDUNDANT FRAUNHOFER RECORDING SYSTEM

Thomas Edward Joseph Gayeski, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,422
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **4 Claims**



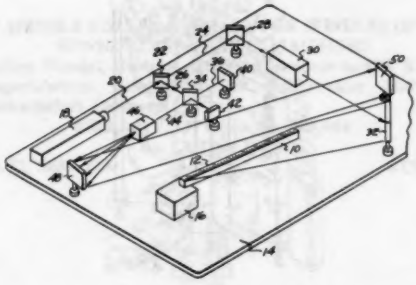
When a pinhole array is employed as a redundancy means in recording a redundant Fraunhofer hologram, such as a holographically prerecorded motion picture, a moving noise is normally present in the reconstructed image when the hologram is moved during playback. The effect of this moving noise is eliminated by situating the hologram recording medium at or in the immediate vicinity of the image plane of the pinhole array during the recording of the hologram. By recording the hologram in this manner, flicker-type noise is also improved.

3,749,470

EXTENDED FIELD DEPTH HOLOGRAPHIC METHOD AND APPARATUS

Gordon M. Brown, Ann Arbor, and Kenneth R. Porter, Pinckney, both of Mich., assignors to GCO, Inc., Ann Arbor, Mich.

Filed Nov. 4, 1968, Ser. No. 773,127
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **3 Claims**



A hologram is formed by simultaneously exposing a photographic plate to light reflected from an object illuminated by a laser and to a composite reference beam derived from a laser. The composite beam includes two components which have traveled through different path lengths from the laser to the photographic plate but which coincide with one another and emanate from the same spatial filter so as to have the same curvature at the plate. The composite beam is formed by passing the laser beam through an interferometer which divides the beam into two components, and recombines them after they have gone through different path lengths. Since the components have traveled through different distances to arrive at the plate they will be coherent with reflections from separated areas on the object, thereby allowing the photographic plate to record interference patterns with reflections emanating from larger areas of the object than would be possible if only a single component reference beam were employed. After development of the plate, the image may be reconstructed by appropriately illuminating the hologram with any coherent light.

3,749,471

METHOD OF PRODUCING AN IRRIDESCENT PATTERN ON THE SURFACE OF A SHEET OR OTHER OBJECT AND SHEETS OR OBJECTS HAVING PATTERNED SURFACE PRODUCED BY THIS METHOD

John Mallard, Welwyn, England, assignor to F.J. Warren Limited, Ware Hertfordshire, England

Filed July 15, 1971, Ser. No. 163,109
Claims priority, application Great Britain, July 16, 1970, 34,599/70
Int. Cl. G02b *5/12*
U.S. Cl. 350—109 **11 Claims**

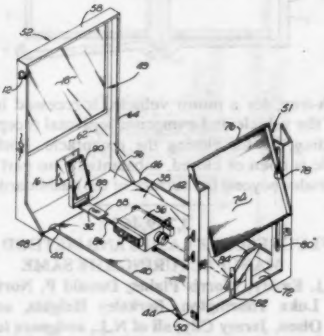
An irridescent surface pattern comprising an array of deformations superimposed on an array of dots marked on an impressionable light-reflecting surface, the spacing between the dots and the spacing between the deformations differing by a small percentage. In one embodiment the dots are produced by half-tone printing on the foil of a foil-laminated sheet of paper and the deformations are produced by embossing the foil with a half-tone plate made of triacetate sheet material using a screen size different to the screen size used by the plate for printing the dots.

3,749,472

ARTIST'S AID APPARATUS

Jesse R. Young, 5302 W. 138th St., Hawthorne, Calif.

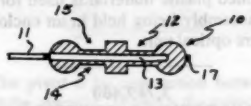
Filed Apr. 10, 1972, Ser. No. 242,672
Int. Cl. G03b *21/58*
U.S. Cl. 350—121 **7 Claims**



An apparatus is disclosed, as for use by an artist, which may be reduced to a compact unit and which opens for use with a photographic projector, to provide a support surface, upon which a photographic image is projected and a canvas or other

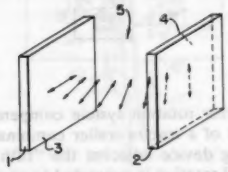
medium is supported. The unit incorporates a platform for receiving the projector, terminated at one end by a hinged, working-surface member incorporating a glass panel, and terminated at the other end by a reflective structure. In use, an image may be projected to a desired size (by the use of the reflective structure) to appear upon the working surface and upon which an artist's medium is supported. The platform member, working-surface member and reflective structure are hinge mounted to be folded into parallel-plane relationship thereby reducing the structure to a compact closed unit.

3,749,473
LANDING GEAR LEVER KNOB
Theodore C. Stewart, 326 Shade Dr., Fairborn, Ohio
Filed Nov. 4, 1971, Ser. No. 195,712
Int. Cl. G02b 27/28
U.S. Cl. 350—156 **4 Claims**



An aircraft landing gear-control handle having a knob member formed from a pair of matching knob-half portions united together into a single knob unit, and constructed from a polarized plastic material that is respectively circularly polarized in clockwise and counterclockwise directions to thereby prohibit the transmittal of ambient light therethrough.

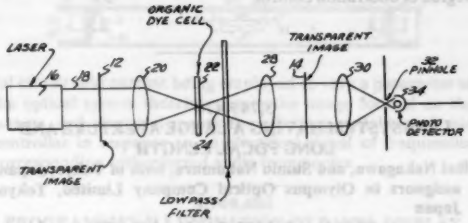
3,749,474
ORIENTED LIGHT SCATTERING DISPLAY DEVICE
James V. Cartmell, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Nov. 26, 1971, Ser. No. 202,091
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC **9 Claims**



An electro-optical, light scattering display device which employs nematic liquid crystal material is disclosed. The faces of the device bearing the conductive electrodes are unidirectionally oriented by rubbing. The liquid crystals align with their molecular axes parallel to the surface of the faces and along the rubbing direction with the field off. When the field is on, dynamic light scattering occurs in the electrode area. Due to this rubbing alignment, a rapid response between the on-off states is evident.

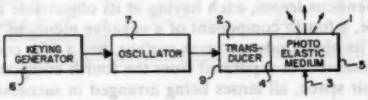
3,749,475
COHERENT OPTICAL DEVICE UTILIZING AN ORGANIC DYE CELL TO DESTROY THE COHERENCE OF A WAVE ENERGY SIGNAL
David M. Shupe, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed July 21, 1972, Ser. No. 274,018
Int. Cl. G02f 1/00
U.S. Cl. 350—160 R **2 Claims**

An image correlator in which a beam of laser light is projected through two aligned, partially transparent images, and in which the intensity of the beam downstream from the two images is measured to determine image correlation is described herein. A thin organic dye cell is disposed between the two images to destroy the coherency of the laser beam and thereby decrease the effect that slight variations in image



alignment will have on correlation measurements. The organic dye cell destroys beam coherence very effectively, is inexpensive, convenient to use, and is also inherently faster than a rotating ground glass element which is used in prior art correlators to destroy beam coherence.

3,749,476
RESONANT ACOUSTO-OPTICAL DEVICE
Richard T. Daly, Huntington; Robert A. Kaplan, South Huntington, and Martin G. Cohen, Huntington, all of N.Y., assignors to Quantronix Corporation, Smithtown, N.Y.
Continuation-in-part of Ser. No. 76,681, Sept. 30, 1970, abandoned. This application Feb. 16, 1972, Ser. No. 226,884
Int. Cl. G02f 1/30
U.S. Cl. 350—161 **24 Claims**



An acousto-optical device for intermittently transmitting a light beam including a body of photoelastic material shaped to provide resonant paths of different lengths for one or more beams of acoustic waves, each of which is periodically interrupted for predetermined time intervals. The light beam, which is normally scattered by interaction with the acoustic beams, is transmitted through the body of photoelastic material only when the interrupted intervals of all acoustic beams coincide simultaneously with the light beam.

3,749,477
ANAMORPHIC LENS SYSTEM
John H. Willoughby, 1232 El Vago St., La Canada, and Barry G. Broome, 415 E. Foothill, Monrovia, both of Calif.
Filed Aug. 16, 1971, Ser. No. 171,942
Int. Cl. G02b 13/08
U.S. Cl. 350—181 **22 Claims**

An anamorphic lens system is disclosed for attachment to cameras having low effective aperture prime lenses. The lens

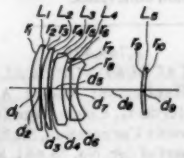
system comprises a plurality of plastic lens elements having a low dispersion property. The lens elements are characterized in that the aberration introduced by one or more elements in the positive sense is matched by one or more elements in the negative sense. These capabilities enable the lens system to be manufactured more economically, while still having a high degree of aberration control.

3,749,478

LENS SYSTEM HAVING A LARGE APERTURE AND LONG FOCAL LENGTH

Jihei Nakagawa, and Sumio Nakamura, both of Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 7, 1972, Ser. No. 241,927
Claims priority, application Japan, Apr. 10, 1971, 46/22087
Int. Cl. G02b 9/60
U.S. Cl. 350—216 **3 Claims**



A lens system having a large aperture and a long focal length, which is constructed as five components and five lenses and consists of first, second and third components of positive meniscus lenses, each having at its object side a convex surface, a fourth component of a negative meniscus lens that has at its object side a convex surface, and a fifth component of a positive lens separated from the fourth component by a large air space, all lenses being arranged in succession from the side of an object, and which is defined by the following five conditions, i.e.,

1. $n_1+n_2+n_3/3 > 1.6$,
2. $3f > f_{1,2,3} > 4f_{1,2,3}$,
3. $n_4 > 1.7$,
4. $0.24f > d_1 + d_2 + d_3 + d_4 + d_5 + d_6 S\ 0.12f$, and
5. $\nu 1 > 50$, $\nu_3 > 50$ and $\nu_5 > 48$

where f is a composite focal length of the total lens system, f_3 is a focal length of the third component, $f_{1,2,3}$ is a composite focal length of the first, second and third components, $n_1, n_2, \ldots n_5$ are refractive indices of the successive lenses counted from the object side, $\nu_1, \nu_2, \ldots \nu_5$ are Abbe's numbers of the successive lenses counted from the object side, and $d_1, d_2, \ldots d_9$ are axial thicknesses of the successive lenses or air spaced between the successive lenses.

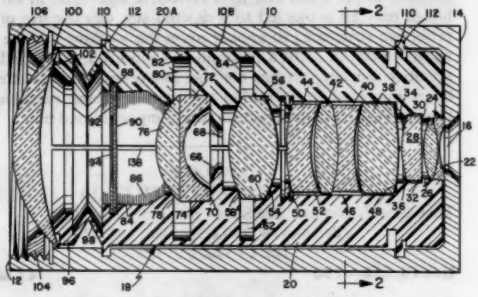
3,749,479

CLAMSHELL TYPE OPTICAL MOUNTING

Paul S. Kempf, 205 Stratford Ct., Del Mar, Calif.

Continuation of Ser. No. 884,065, Dec. 11, 1969, abandoned. This application Aug. 27, 1971, Ser. No. 175,751
Int. Cl. G02b 7/02
U.S. Cl. 350—252 **13 Claims**

An optical mounting having a pair of clamshell type elements preformed to hold a specific array of optical components between the elements in precise optical alignment, without the need for individual spacers, lock rings and the like. Portions of the mounting elements have limited deformability to accommodate reasonable discrepancies in thickness and diameter of lenses and other optical components. Low



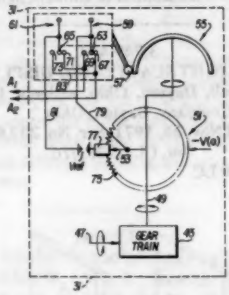
cost, easily formed plastic material is used for the mounting elements, the assembly being held in an enclosing sleeve or barrel as a secure optical unit.

3,749,480

MIRROR ROTATION CORRECTION SYSTEM

Ralph W. De Witt, 68 Spring Ave., Latham, N.Y., and David A. De Witt, 9 Wempel Building Netherlands Village, Schenectady, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,139
Int. Cl. G02b 5/08
U.S. Cl. 350—289 **16 Claims**



A rear view mirror rotation system compensating for the relative movement of a tractor-trailer combination having a mechanical sensing device adjacent the "fifth wheel." The relative mechanical rotation is converted to an analog electrical signal for rotating the appropriate rear view mirror so that the driver can maintain a line of vision to the rear wheels of the trailer. Hook-up and initial alignment of the system is quite simple requiring only the attachment of a sensor and certain adjustments to the electrical circuitry that can be made by the driver of a rig from within the cab of the tractor. No substantial modification or adaptation of the trailer is required other than to provide a simple retainer or fastener for the sensor. Thus, a tractor equipped with the system can be used universally with any trailer.

3,749,481

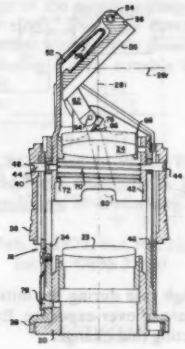
VERTICAL SLIT ADJUSTMENT DEVICE FOR A SLIT LAMP

Irwin A. Bosack, and Milton H. Sussman, both of Buffalo, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 20, 1971, Ser. No. 135,563
Int. Cl. A61b 3/10
U.S. Cl. 351—14 **3 Claims**

A slit lamp illumination system in which the reflex mirror rotates about the axis of mirror incidence and about a pivot

axis perpendicular thereto for combined horizontal and vertical sweep of the illumination beam across the eye interior. The objective lens remains parfocalized while the pivot action



takes place. The pivot is by cam action between the mirror support and a tube assembly in which the mirror and objective are mounted.

3,749,482

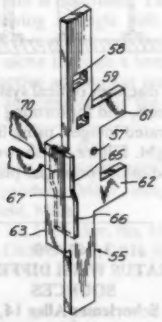
MOTION PICTURE FILM PROJECTOR

Donald Greenwood, Akron, Iowa, assignor to G-L-J Toy Co., Inc., New York, N.Y.

Filed Jan. 20, 1972, Ser. No. 219,408

Int. Cl. G03b *21/32*

U.S. Cl. 352—80 **7 Claims**



A motion picture for projecting different sizes of film has an advancing claw laterally displaceable to line up with the perforations on the different width film strips. A film gate having different sized masking apertures is shiftable longitudinally. The film gate has two laterally spaced guide slots joined by a connecting slot. The film advancing claw is shifted between the guide slots by way of the connecting slot when the film gate is shifted to for accomidating the different sized films.

3,749,483

AUDIO-SENSITIVE DEVICES

Barrie Lowe, 8, Albert Gate Ct., 124, Knightsbridge, London, England

Filed Oct. 19, 1970, Ser. No. 81,951

Claims priority, application Great Britain, Oct. 20, 1969, 51,411/69

Int. Cl. G03b *31/00*

U.S. Cl. 353—15 **17 Claims**

Optical projection apparatus comprising an optical system having a light source, lens means, a screen on to which, in operation, light from the light source focussed by the lens means is projected to form an image and an aperture of variable size between the light source and the lens means; motor means for driving said aperture to vary the size thereof; a static switching controller for controlling current in an electri-

cal circuit said current being employed to vary a parameter of the optical system thereby to vary the image formed on the screen; and electrical means for effecting switching of said controller in response to an electrical signal of frequencies corresponding with selected audio frequencies.

3,749,484

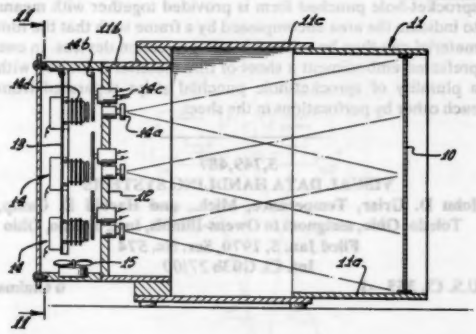
PROGRAMMED ILLUMINATION OF PANEL DISPLAY SECTIONS

Kenneth A. Busche, 18728 Prairie St., Northridge, Calif.

Division of Ser. No. 803,807, March 3, 1969, Pat. No. 3,596,016. This application Jan. 7, 1971, Ser. No. 104,813

Int. Cl. G03b *21/26*

U.S. Cl. 353—30 **2 Claims**



The disclosure concerns control apparatus, usable for controlling information displays, and including a bi-stable mechanical switching device adapted to be set and re-set, and a programming element such as a sheet or drum movable between programming positions in which a shoulder or opening is selectively presented for controlling setting or re-setting of the switch device as the element is further moved in its programming position.

3,749,485

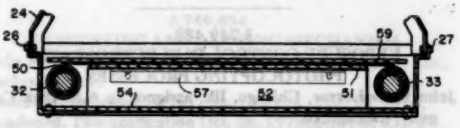
SHADOW-LINE PROJECTOR FOR ASSEMBLY REFERENCE

Andrew G. Carter, and Charles L. Morgan, both of Grand Rapids, Mich., assignors to Carter Products Company, Inc., Grand Rapids, Mich.

Filed Dec. 10, 1970, Ser. No. 96,871

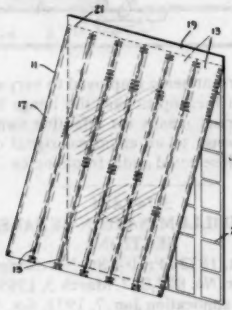
Int. Cl. G03b *21/00*

U.S. Cl. 353—62 **3 Claims**



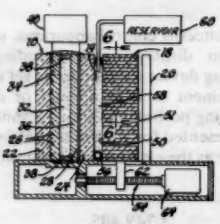
A shadow-line projector adapted to establish reference lines on a work surface, the lines being shadows cast by stripes located on a transparent sheet preferably carried by rollers capable of shifting the sheet to project a plurality of sets of reference lines in sequence.

3,749,486
FILM STRIP
Karen B. Smukler, 5450 Fenwood Ave., Woodland Hills, Calif.
Filed July 29, 1970, Ser. No. 58,897
Int. Cl. G03b 21/00
U.S. Cl. 353—120 **2 Claims**



Sensitized and unsensitized transparent film material in sprocket-hole punched form is provided together with means to indicate the area encompassed by a frame such that the film material can then be utilized in still projection devices. In one preferred embodiment a sheet of film material is formed with a plurality of sprocket-hole punched strips separated from each other by perforations in the sheet.

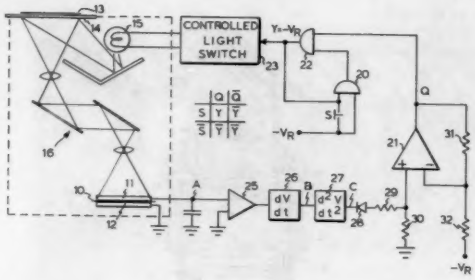
3,749,487
VISUAL DATA HANDLING SYSTEMS
John D. Grier, Temperance, Mich., and Harold E. Camp, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 5, 1970, Ser. No. 574
Int. Cl. G03b 27/00
U.S. Cl. 355—1 **6 Claims**



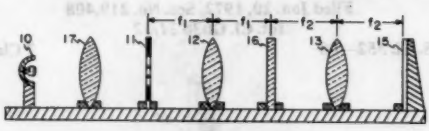
A visual data handling system incorporating a visual display device to provide an illuminated display of data. A print-through device utilizing a matrix of light conducting elements transfers the illuminated display of data to a light responsive type printer. This illumination transfer can be selectively interrupted by a turn-off mechanism, which does this by maneuvering the print-through device. Also, the light conducting elements can incorporate lasing devices to intensify the illumination.

3,749,488
EXPOSURE CONTROL IN ELECTROSTATIC PHOTOCOPYING PROCESSES
John H. DeLorme, Chicago, Ill., assignor to A.B. Dick Company, Chicago, Ill.
Filed May 15, 1972, Ser. No. 253,045
Int. Cl. G03g 15/00
U.S. Cl. 355—3 **5 Claims**

Automatic exposure control for optimum contrast in an electrostatic photocopying process is disclosed using an electrometer to detect average charge of a photoconductive film during exposure, and detecting a change in the rate of discharge from a high rate during the initial period of underexposure to a low rate of over-exposure. Exposure is then terminated upon detecting that change.

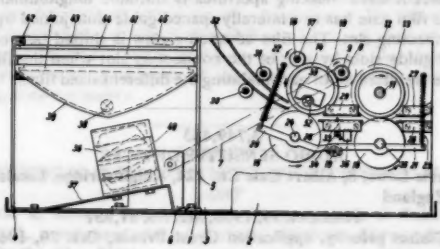


3,749,489
OPTICAL IMAGING
George B. Parrent, Jr., Carlisle, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.
Filed July 1, 1965, Ser. No. 469,977
Int. Cl. G03b 27/68
U.S. Cl. 355—52 **22 Claims**



The specification discloses optical systems for forming aberrated images of objects, and for forming true images of the objects from the aberrated images, using light filters in the path of image-forming light. Filters are shown located in a Fourier transform plane, and in the principal plane of an image-forming lens system.

3,749,490
COPYING APPARATUS WITH DIFFERENT RADIATION SOURCES
Gerhard Ritzerfeld, Schorlemer Allee 14, Berlin, Germany
Filed July 17, 1970, Ser. No. 55,697
Claims priority, application Germany, July 29, 1969, P 19 39 171.0
Int. Cl. G03b 27/04
U.S. Cl. 355—89 **10 Claims**



A copying apparatus comprises a first copying device including a source of visible light, a second copying device including a source of invisible heat radiation, and a third copying device including a source of infrared radiation. An original

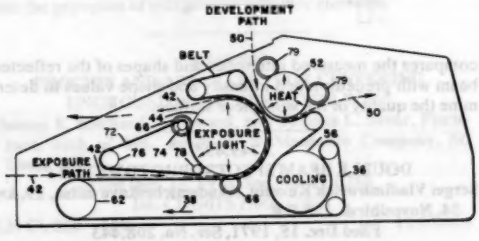
is placed, together with a light sensitive copy sheet, in the first copying device so that a negative image is formed on the copy sheet. The negative copy sheet is placed together with a heat sensitive positive copy sheet in the second copying device so that a positive image of the negative image is formed on the heat sensitive copy sheet. The copy sheet with the positive image is placed together with another sheet, in the third copying device for producing a copy suitable for use as a hectographic master sheet.

3,749,491

MICROFICHE DUPLICATOR

Frank L. Maxfield, La Mesa, and Roger B. Trimble, San Diego, both of Calif., assignors to Stromberg Datagraphix Inc., San Diego, Calif.

Filed Feb. 7, 1972, Ser. No. 224,100
Int. Cl. G03b 27/30
U.S. Cl. 355—106 5 Claims



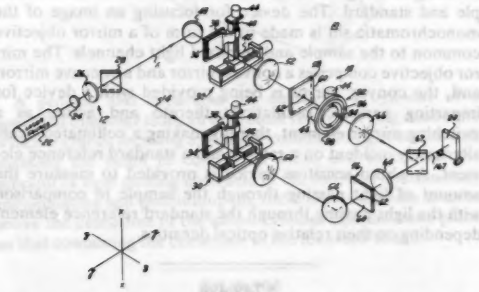
A device for duplicating individual microfiche onto heat developable vesicular film is described. This device utilizes a single drive system driving a single belt to first carry the original and copy films through an exposure station and then to carry the copy film alone through a heat development station. A simple and effective adjustment system is provided to assure proper tracking and operation of the drive belt.

3,749,492

INTERFEROMETRIC HYPSOCLINE GENERATOR

Daniel C. Kowalski, Wyandotte, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 22, 1971, Ser. No. 155,459
Int. Cl. G01c 11/04; G01b 9/02
U.S. Cl. 356—2 26 Claims



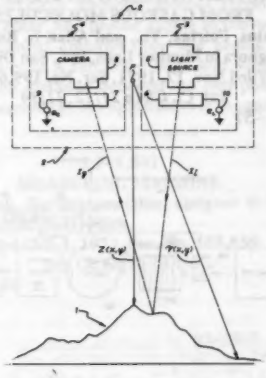
A hypsocline or interference pattern having a shape and position representing the shape and position of an isoelevation area in a scene is produced from two phototransparent stereo images by directing mutually coherent collimated laser beams to strike the two stereo images. The images diffract the beams and thus transmit image information to the laser beams. The diffracted beams are directed to intersect, and any portions of the two intersecting beams representing the same area in the scene that are in registration with each other provide an interference pattern comprising alternate light and dark lines. The interference pattern has the shape and position of the represented area in the scene. The images are oriented with respect to each other so that the patterns produced represent isoelevation areas in the scene. A relative movement is provided between one stereo image and the beam striking that image to alter the portions in registration and thus provide different interference patterns representing areas at different elevations. The D.C. spatial frequency components are removed from the diffracted beams in order to maximize the difference between the interference patterns representing isoelevation areas and background signals surrounding those interference patterns.

3,749,493

METHOD AND APPARATUS FOR PRODUCING A CONTOUR MAP OF A SURFACE AREA

Albert Macovski, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 5, 1972, Ser. No. 215,520
Int. Cl. G01c 11/12
U.S. Cl. 356—2 33 Claims



Altitude contour lines are generated on the image of a surface so that a photographic contour map can be made. The contour lines are generated as light interference fringes (a light interference pattern) by modulating both the light illuminating the surface being mapped and the light reflected from the surface. Modulation of either the illuminating or the reflected light must be periodic and the altitude difference between contour lines is determined by the frequency or periodicity of modulation.

3,749,494

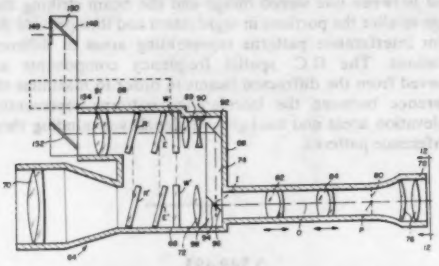
GUN SIGHTING AND RANGING MECHANISM

Marvin P. Hodges, Penfield, N.Y., assignor to Ranging, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 755,192, Aug. 26, 1968, abandoned. This application Oct. 26, 1970, Ser. No. 83,724
Int. Cl. F41g 1/52; G01c 3/04
U.S. Cl. 356—16 13 Claims

A gun sighting and ranging mechanism in which the operation of ranging the mechanism on the target by the operator automatically adjusts the sights of the gun for precise trajecto-

ry compensation at any shooting distance for any bullet. The sighting and ranging mechanism has two separate objective



lens systems for focusing two separate images of the target at a common image plane which are viewed through a single eyepiece.

3,749,495

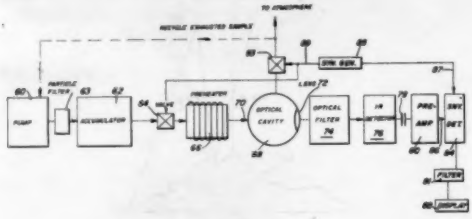
GAS ANALYZER UTILIZING INFRARED EMISSION FROM GASEOUS MOLECULES

Paul E. Wilkins, Fairfax, Va., and Allan L. Budd, San Diego, Calif., assignors to Monitor Labs, Inc., San Diego, Calif.

Filed Nov. 17, 1971, Ser. No. 199,650

Int. Cl. G01n *21/22, 21/34*

U.S. Cl. 356—51 **8 Claims**



A gaseous sample is introduced into an optical cavity where the sample undergoes periodic compression and expansion. A detector is provided for measuring the variation in infrared emission from certain chemical components in the gas, as the gas undergoes compression and expansion. The measurement reveals the concentration of the component chemicals relative to the gas sample.

3,749,496

AUTOMATIC QUALITY CONTROL SURFACE INSPECTION SYSTEM FOR DETERMINING THE CHARACTER OF A SURFACE BY MEASURING THE SHAPE AND INTENSITY OF A MODULATED BEAM

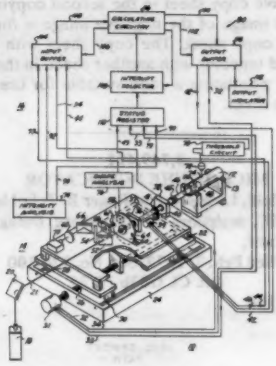
Edwin D. Hietanen, Birmingham, Mich., and Robert J. Valek, Brookfield, Wis., assignors to The Bendix Corporation, Southfield, Mich.

Filed July 16, 1971, Ser. No. 163,220

Int. Cl. G01n *21/00, 21/32*

U.S. Cl. 356—73 **5 Claims**

An apparatus that automatically inspects the inside surface of a cylindrical workpice, such as a brake cylinder, by reflecting a beam of laser light from that surface. The intensity of the reflected beam is measured to detect the presence and severity of any surface flaws. The shape of the beam is measured to determine the smoothness of the cylinder surface. A computer



compares the measured intensities and shapes of the reflected beam with predetermined intensity and shape values to determine the quality of the workpiece surface.

3,749,497

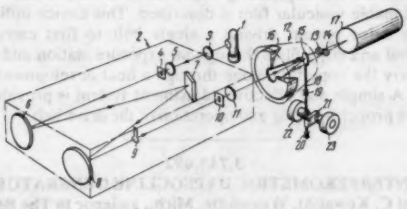
DOUBLE BEAM SPECTROPHOTOMETER

Sergei Vladimirovich Kuzmin, Akademicheskaya ulitsa, 19, kv. 54, Novosibirsk, U.S.S.R.

Filed Dec. 15, 1971, Ser. No. 208,443

Int. Cl. G01j *3/42*; G02b *17/00*

U.S. Cl. 356—93 **3 Claims**



In a spectrophotometer a light beam consecutively passes through a monochromator, a sample and standard light channel mirror-switch; the spectrometer includes a device for focusing an image of the monochromator exit slit on the sample and standard. The device for focusing an image of the monochromatic slit is made in the form of a mirror objective common to the sample and standard light channels. The mirror objective comprises a convex mirror and a concave mirror, and, the convex mirror is being provided with a device for imparting periodic oscillations thereto and acting as a switching mirror element, thereby making a collimated beam alternately incident on a sample and a standard reference element. A photo sensitive device is provided to measure the amount of light passing through the sample in comparison with the light passing through the standard reference element depending on their relative optical densities.

3,749,498

DOUBLE-PASS TYPE DOUBLE MONOCHROMATOR

Teiichi Shimomura, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto City, Japan

Filed Feb. 25, 1971, Ser. No. 118,614

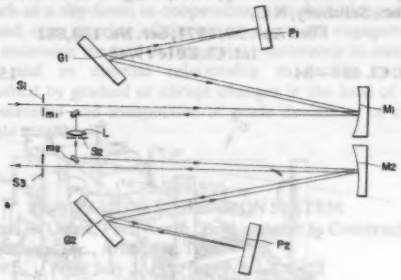
Claims priority, application Japan, Feb. 25, 1970, 45/18559 (utility model)

Int. Cl. G01j *3/06, 3/18*

U.S. Cl. 356—101 **4 Claims**

The present invention is to provide a double-pass type double monochromator having a high resolving power and an im-

proved relative speed. To this end, there is provided an improved optical system in which the number of times light



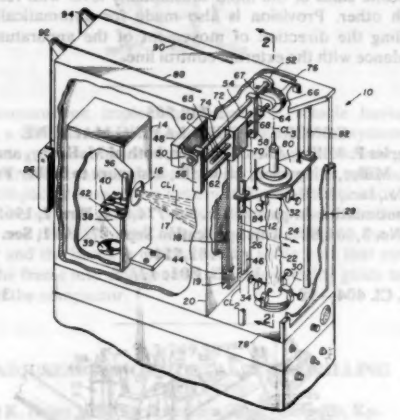
passes through the light dispersing element is doubled only with the provision of inexpensive reflector elements.

3,749,499

PROCESS AND APPARATUS FOR CENTERING UNGROUND SEMICONDUCTOR RODS

Thomas E. Reichard, Kirkwood, and Thomas L. Bever, Florissant, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1971, Ser. No. 212,265
Int. Cl. G01b *1/00, 11/00*
U.S. Cl. 356—150 **12 Claims**



A process and apparatus for obtaining a cylinder of a specified diameter from an unground rod of varying diameters which includes focusing a beam of collimated light on the rod, masking the beam to control its width and to control the amount of light passing each side of the rod, and continuously manipulating and positioning the rod within the beam so as to move the centerline of the above cylinder into the same plane as that containing the centerline of the focussed beam.

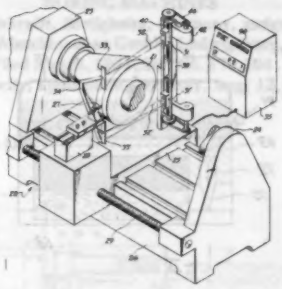
3,749,500

OPTICAL CALIPER AND EDGE DETECTOR-FOLLOWER FOR AUTOMATIC GAGING

Gerald J. Carlson, Scotia, and Harry R. Summerhayes, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1970, Ser. No. 100,854
Int. Cl. G01b *11/00*
U.S. Cl. 356—156 **7 Claims**

An automatic optical caliper for gaging linear dimensions of objects employs a pair of independently adjustable laser light beams, forming the arms of the caliper, that seek opposite edges of the object. Each light beam is sensed by a photodetector moving in synchronism with the beam, and the output signal controls a servo feedback system to position the beam to be partially interrupted by one edge of the object. The distance between the two light beams so positioned is measured by electronic or optical techniques and is the desired measurement. Preferably the light transmitted past the object



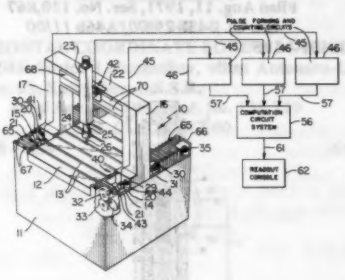
edge is detected, but backscattered light reflected by the object can be detected instead. Typical applications are to accurately gage a workpiece diameter without knowledge of the position of the center, and profile gaging of the workpiece. A different embodiment employs only one gaging light beam positioned initially at a reference edge and subsequently at another edge, the distance between the two positions being the desired measurement. An application is to gage tool wear.

3,749,501

MEASURING MACHINE

Heinrich J. Wieg, Burlington, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 1, 1971, Ser. No. 185,650
Int. Cl. G01b *11/04*
U.S. Cl. 356—169 **3 Claims**



A dimensional measuring machine is provided and has a pair of parallel ways arranged on opposite sides of the machine and a pair of supports supported for reciprocating movements on the ways, with an elongated bridge construction extending substantially perpendicular and being carried by the supports. A gage head is provided and carried on a carrier which is supported for reciprocating movements along the bridge construction. The machine has means measuring the positions of the supports along the ways and providing electrical output signals and means measuring the position of the carrier along the bridge construction and providing another electrical output signal. The machine also has an electrical system for receiving and comparing the electrical signals and providing a signal representing the actual position of the carrier and gage head from a reference location.

3,749,502

APPARATUS FOR SELECTIVELY SIMULTANEOUSLY CLEANING, DISINFECTING AND DRYING OF SURFACES

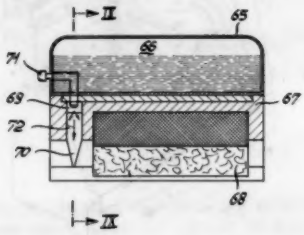
Hermann Kreihe, Sterngasse 20, 52 Siegburg, Germany

Continuation of Ser. No. 867,775, Oct. 20, 1969, abandoned. This application Dec. 2, 1971, Ser. No. 204,165

Claims priority, application Germany, Oct. 21, 1968, P 18 04 240.5; Dec. 6, 1968, P 18 13 135.6

Int. Cl. A47l *13/26, 13/30*

U.S. Cl. 401—139 3 Claims



An apparatus for selectively simultaneously cleaning, disinfecting and drying surfaces which includes plate means having in the bottom side thereof arranged sponge means while passage means in the plate means communicate with fluid storage means for receiving the cleaning and disinfecting fluid and either lead to the sponge means or lead directly to the bottom side of the plate means for applying fluid to the surface to be treated in response to the establishment of communication between the fluid storage means and the passage means.

3,749,503

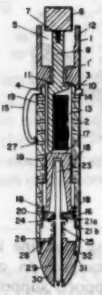
TOOTH BRUSH-RETRACTABLE PEN

Wolfgang F. Duerr, 240 Main St., Gladstone, N.J.

Filed Aug. 11, 1971, Ser. No. 170,867

Int. Cl. B43k *29/00;* A46b *11/00*

U.S. Cl. 401—195 15 Claims



A writing ink-pen, as a preferred embodiment, tooth brush unit having an interrelated ejection-retraction mechanism for separate selective ejection one at a time of either the pen or the tooth brush, each of which when separately ejected is lockable in an ejected state and position, and when one of the pen and tooth brush is ejected, the other being non-ejectable and unexposed within an enclosing casing, and the ejection-retraction mechanism including a spring biasing each of the pen and the tooth brush, the casing serving as a tooth-brush handle when the tooth brush is ejected.

3,749,504

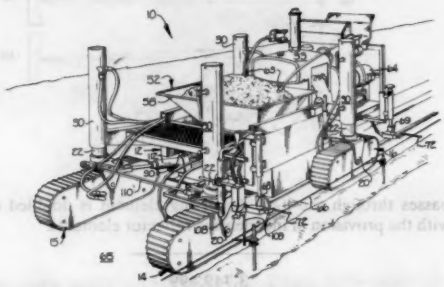
APPARATUS FOR FORMING A CONTINUOUS CURB STRUCTURE

Roy W. Smith, Salisbury, N.C., assignor to Power Curbers, Inc., Salisbury, N.C.

Filed Apr. 30, 1971, Ser. No. 138,882

Int. Cl. E01c *19/48*

U.S. Cl. 404—84 15 Claims



An apparatus for forming a continuous strip of pavement such as a curb, gutter or the like along a prepared ground surface. The apparatus is self-propelled and includes a mold adapted to continuously extrude a preformed paving strip as the apparatus moves along the ground. Provision is made for automatically adjusting the elevation of the mold according to an externally positioned control line, and for maintaining the opposite sides of the mold substantially level with respect to each other. Provision is also made for automatically controlling the direction of movement of the apparatus in accordance with the external control line.

3,749,505

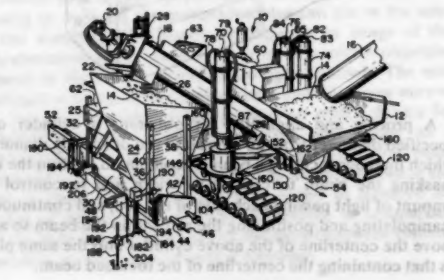
CONCRETE CURB LAYING MACHINE

Charles P. Miller; Allen R. Miller, both of McHenry, and David J. Miller, Ringwood, all of Ill., assignors to Miller Formless Co., Inc., McHenry, Ill.

Continuation-in-part of Ser. No. 774,014, Nov. 7, 1968, Pat. No. 3,606,827. This application Sept. 17, 1971, Ser. No. 181,514

Int. Cl. E01c *11/28*

U.S. Cl. 404—98 3 Claims



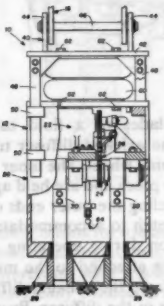
A machine for handling, conveying, compacting and distributing formable material such as concrete upon or along a work location in the desired grade, slope and directional configuration defined by an external reference extending along the path of travel. In one embodiment the machine includes a concrete receiving hopper on one side and a conveyor which elevates the concrete across the machine into a compaction hopper on the other side for gravity feeding to a working tool, such as a mule shoe. The receiving hopper is located on one side and pivotal of the machine and the compaction hopper

and working tool are on the other side, with the conveyor in between; an arrangement found to supplement the leveling, traction and steering capabilities of wheels and tractor supported vehicles. The longitudinal side location of the working tool such as a slip-form, in cooperation with the independent front and rear steering of the pairs of ground engagement means maintains the tool in tangential relationship to outside curves and in chordal relationship to inside curves, undisturbed by gradual or abrupt changes in the load of onboard material and irrespective of grade deviations of considerable magnitude.

3,749,506
COMPACTOR SUSPENSION SYSTEM

Raymond E. Lance, Fort Worth, Tex., assignor to Construction Technology, Inc., Arlington, Tex.

Filed July 23, 1970, Ser. No. 57,452
Int. Cl. E01c *19/30*
U.S. Cl. 404—133 **2 Claims**

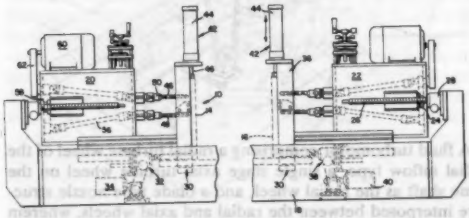


A construction implement includes a vehicle having a boom, a compactor, and a compactor suspension system for supporting the compactor on the boom and for isolating the vheicle from vibrations caused by operation of the compactor. The compactor suspension system includes a frame mounted on the boom and at least one air bag mounted between the frame and the compactor. The alignment between the compactor and the boom is maintained by guide bars that extend from the frame into engagement with cooperating guide members on the compactor.

3,749,507
ADJUSTABLE HORIZONTAL HOLE DRILLING APPARATUS

Ernest K. Haley, 134 Northwestern Pky., Louisville, Ky.

Filed Dec. 27, 1971, Ser. No. 211,897
Int. Cl. B23b *39/18*
U.S. Cl. 408—46 **1 Claim**

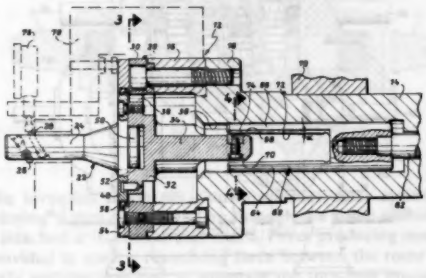


Adjustable horizontal hole drilling apparatus for simultaneous drilling of a plurality of holes in work pieces such as steel beams and the like, wherein reciprocably movable horizontally opposed heads mount drills in horizontally opposed movable relationship for operating engagement with opposite sides of the work piece, the drills being positionally vertically adjustable conjointly and severally, and wherein work piece hold down and element clamping means are provided. The apparatus is especially suited for, although not restricted to, drilling of holes in I-beam flanges.

3,749,508
BORING MACHINES

Friedrich Schukrafft, Bietigheim, Germany, assignor to Ludwigsburger Maschinenbau GmbH, Ludwigsburg, Germany

Filed Aug. 9, 1971, Ser. No. 170,104
Claims priority, application Germany, Aug. 12, 1970, P 20 40 020.8
Int. Cl. B23b *29/034, 51/00*
U.S. Cl. 408—156 **7 Claims**

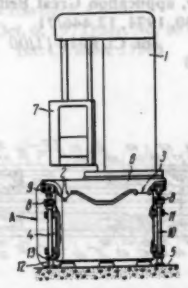


Apparatus for supporting the boring or cutting tools of a boring machine comprising a rotatable spindle, a carrier mounted at one end of the spindle, and a tool holder extending from the carrier. An arm extends rearwardly from the tool holder into engagement with means for pivoting it. A tool holder is connected to the carrier by at least one torsion bar spring defining the swing axis of the tool holder and exerting a restorative force when twisted.

3,749,509
HORIZONTAL COORDINATE BORING MACHINE

Valentin Mikhailovich Lukoshnikov, ulitsa Antonova-Ovseenko, 97, kv. 63, Kuibyshev, U.S.S.R.

Filed Apr. 20, 1971, Ser. No. 135,719
Int. Cl. B23b *47/00*
U.S. Cl. 408—234 **6 Claims**



A horizontal coordinate-boring machine with a longitudinally traversing column in which the horizontal guides of the bed rest on the foundation at three points and are relieved from the weight of the carriage with the column and the head stock mounted in these guides. The relief is provided by means

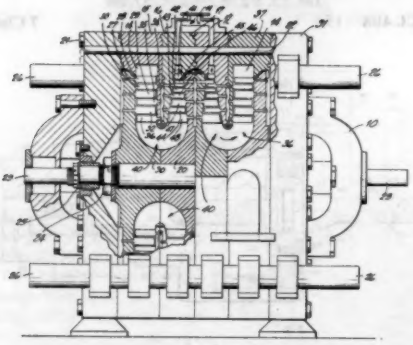
of supports disposed along the guides on either side thereof, and taking up the relief forces as a result of elastic contact between the supports and rolling bodies built into the carriage. The supports are separated from the bed and are mounted directly on the foundation.

3,749,510

RADIAL FLOW INVERTED TYPE STEAM TURBINE

Stanislaw Gabryk, Natal, Republic of South Africa, assignor to Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 16, 1972, Ser. No. 242,265
Int. Cl. F01d *3/02*
U.S. Cl. 415—103 **7 Claims**



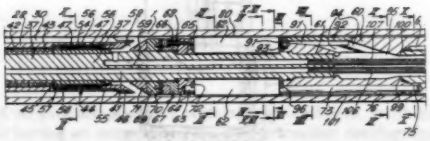
A radial flow steam turbine, with combined impulse and reaction stages on the one rotor. Each set of blades of the turbine has multiple impulse stages with the steam flowing radially inward towards the rotor axis, and leading to multiple reaction stages with the steam flowing radially outward and away from the rotor axis. The impulse stage passages have a tapered shape to accommodate the increase in the volume of steam through the concentric stages of blades with the blades being progressively larger in each circular stage. The reaction passage is of uniform cross-sectional area as the increase in velocity of steam compensates for the increase in steam volume through the passage.

3,749,511

PRESSURIZED SEALING MEANS FOR A HYDRAULIC TURBODRILL

William Mayall, 6 Arundel Garden, Ash Ln., Rustington, Sussex, England

Filed June 29, 1971, Ser. No. 158,039
Claims priority, application Great Britain, June 30, 1970, 31,751/70; Apr. 30, 1971, 12,446/71
Int. Cl. F01d *11/00*
U.S. Cl. 415—113 **5 Claims**



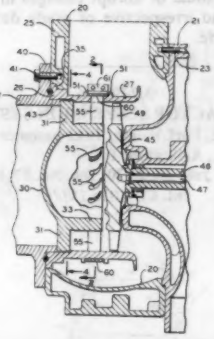
A hydraulic motor of the turbodrill type including a housing, a rotor shaft rotatably mounted via bearings in said housing and connectible to a drill bit to transmit driving/torque thereto, sealing means between the rotor shaft and the housing arranged to oppose access of drilling mud to said bearing means, said sealing means comprising pressurized inner and outer sealing devices.

3,749,512

INLET STRUCTURE FOR TURBO MACHINE

Robert A. Miller, Jeannette, and Arthur J. Miller, Irwin, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,972
Int. Cl. F01d *25/26*
U.S. Cl. 415—136 **8 Claims**



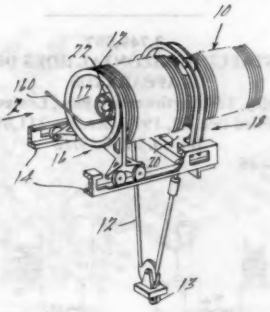
The inlet nozzle blades of a fluid turbo machine are mounted radially in the exhaust diffuser tube encircling the nose piece and the turbine wheel. The inner ends of the nozzle blades engage the nose piece and are held against the same by a clamping band encircling the outer ends of the blades. The clamping band will stretch to accommodate radial growth of the blades by expansion during operating temperatures. An inlet passage member is attached to the machine casing and serves to detachably clamp the exhaust diffuser to the casing and also the nose piece in the diffuser. Provision is made for radial expansion of the nose piece relative to the diffuser.

3,749,513

FLUID TURBOMOTOR

Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 22, 1970, Ser. No. 74,463
Int. Cl. F01d *17/00, 1/08*
U.S. Cl. 415—152 **6 Claims**



A fluid turbomotor comprising a radial turbine wheel of the radial inflow type, a single stage axial turbine wheel on the same shaft as the radial wheel, and a blade type nozzle structure interposed between the radial and axial wheels, wherein the working fluid is introduced at the radial periphery of the radial wheel, is discharged at an axial face of the radial wheel into the nozzle structure, and is directed by the blades of the nozzle structure into the axial turbine wheel; also disclosed is a novel nozzle ring structure for the radial turbine wheel com-

prising two side-by-side blade sets of different angular orientation which are selectively moved into working relationship to the inflow of the radial wheel to vary the direction at which the working fluid is delivered to the radial wheel. The invention turbomotor is disclosed as the power source in an overhead cable hoist structure.

3,749,514

BLADE ATTACHMENT

George W. Kelch, Palm Beach; Bruce J. Taylor, Fort Pierce, and Henry A. Welcer, Palm Beach, all of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 30, 1971, Ser. No. 185,004
Int. Cl. F01d 5/08
U.S. Cl. 416—95 2 Claims

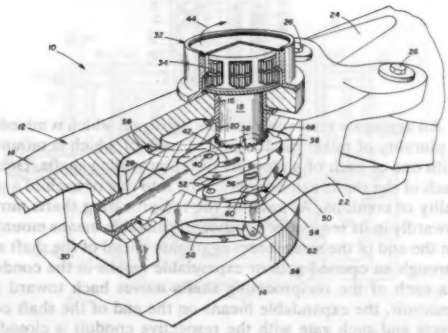
A blade attachment means for use in a small gas turbine engine. A disk is provided having at least two annular flanges extending radially therefrom with a plurality of blades having root fingers metallurgically bonded to the flanges. The flanges being approximately the same length as the blades with the space between the fingers providing for the passage of a coolant to cooling passages in the blade. Said fingers having a brazing area sized so that at least a 50 percent braze coverage will provide the necessary bond strength.

3,749,515

POWERED FOLDING MECHANISM

Cecil Covington, Hurst, and Joe D. Puckett, Smithfield, both of Tex., assignors to Textron Inc., Fort Worth, Tex.

Filed June 1, 1971, Ser. No. 148,824
Int. Cl. B64c 27/50
U.S. Cl. 416—143 9 Claims



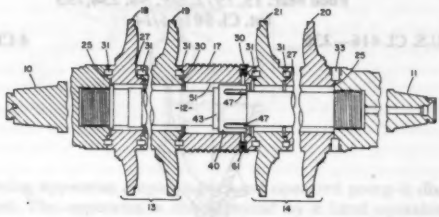
A powered folding mechanism includes a locking pin for normally retaining a blade of a rotary wing aircraft in an extended position relative to a blade grip and a cam for rotation in one direction to first withdraw the locking pin and then fold the blade and for rotation in the opposite direction to first return the blade to the extended position and then re-engage the locking pin. Two embodiments of the powdered folding mechanism are disclosed, one of which operates directly on the blade and the other of which operates by means of a drag link connected between the grip and the blade.

3,749,516

ROTOR STRUCTURE FOR TURBO MACHINES

Norman A. Samurin; Carl H. Geary, both of Greensburg, and Leonard P. Damratowski, Monroeville, all of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 6, 1971, Ser. No. 186,887
Int. Cl. F01d 5/06
U.S. Cl. 416—199 2 Claims



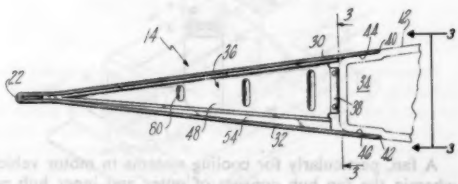
The invention relates to a turbo machine rotor structure employing a thru-bolt extending through the rotor assembly and attached at its ends to stub shafts. Force producing means is provided to exert a restraining force between the rotor assembly and the thru-bolt to maintain the thru-bolt properly preloaded and centered in the rotor assembly in the preferred arrangement. A sleeve member has an end portion fixedly secured on the thru-bolt as by a shrink fit. The remainder of the sleeve is formed with slots extending from the opposite end of the sleeve and terminating at the fixed end portion thereof. The slots form circumferentially spaced apart resilient cantilever portions extending from the fixed portion of the sleeve and being spaced in concentric relation to the thru-bolt and the bore of the rotor assembly. The rotor assembly is provided with means such as radially disposed screw members for exerting a radially inward force against the free ends of the cantilever portions and serving to center the thru-bolt in respect to the rotor assembly and to exert a restraining preloading force on the cantilever portions.

3,749,517

HELICOPTER BLADE WITH UNIVERSALLY REPLACEABLE POCKETS

Charles Galli, Trumbull, Ohio, assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 6, 1971, Ser. No. 187,041
Int. Cl. B64c 27/46
U.S. Cl. 416—226 14 Claims



To permit replacement of any of the individual helicopter blade trailing edge pockets, without respect to spar thickness at the span station of the pocket, a replacement pocket is provided which includes top and bottom skin members hinged at their after end to form the blade trailing edge, and tapered

support members positioned along the blade chord between the skin members and with adjacent support members joined to opposite skin members and defining a gap between the support member and the skin member to which it is not attached, and selectively shaped shim members positioned in these gaps and joined to both support member and the skin member and being of selected height so that the forward end of the pocket member will be of a thickness substantially the same as the thickness of the blade spar to which it will attach.

3,749,518

COMPOSITE BLADE ROOT CONFIGURATION

Alf S. Alver, Wapping, and Walter Pilpel, West Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 15, 1972, Ser. No. 234,755
Int. Cl. F01d *5/14*
U.S. Cl. 416—230 **4 Claims**

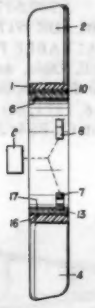
In a fiber reinforced composite blade, the fibers are extended from the airfoil into the right and left side of the root. It is carefully determined which fibers are extended into the left side and which are extended into the right side to assure that all the fibers are wholly contained within the root and the minimum acceptable bend radius of the fibers is not violated.

3,749,519

FAN, PARTICULARLY FOR COOLING SYSTEMS IN MOTOR VEHICLES

Anton Ryba, Freiheitsstrasse 57/21, Bozen, Italy

Filed Mar. 9, 1971, Ser. No. 122,372
Claims priority, application Austria, Mar. 12, 1970, 2309/70
Int. Cl. F04d *29/34*
U.S. Cl. 416—241 **3 Claims**



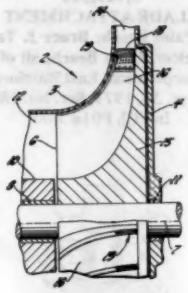
A fan, particularly for cooling systems in motor vehicles, wherein the fan hub consists of outer and inner hub parts which are inserted one within the other and fastened together. The outer hub part carries the fan blades and the inner hub part, which may optionally be composed of two or more segments, is provided with the device for connection to the clutch and being made of a nonmetallic material having greater resistance to heat than the material of which the outer hub part carrying the fan blades is made.

3,749,520

CENTRIFUGAL COMPRESSOR BLADING

Phiroze Bandukwalla, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 186,302
Int. Cl. F01d *5/04*
U.S. Cl. 416—183 **2 Claims**



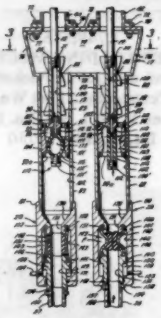
A centrifugal compressor, which may otherwise be conventional, has the tip portion of the impeller blades made of a porous material to allow some of the air to flow from the forward face of the blade through the blades to the rear face to promote more uniform velocity at the impeller exit and thus reduce mixing losses and improve the slip factor of the compressor.

3,749,521

METHOD AND APPARATUS FOR AN AGGREGATE PUMP

Malcolm G. Coone, 10521 Green Willow, Houston, Tex.

Filed Oct. 1, 1970, Ser. No. 77,068
Int. Cl. F04b *15/02, 21/04*
U.S. Cl. 417—53 **30 Claims**



An aggregate reservoir receives aggregate which is mixed by a plurality of mixer blades, one of each of which is mounted with one of each of a plurality of reciprocating shafts. One of each of the shafts extends outwardly into one of each of a plurality of conduits. As each of the reciprocating shafts moves inwardly in its respective conduit, expandable means mounted on the end of the shaft forces aggregate ahead of the shaft and through an opened gate or expandable means in the conduit. As each of the reciprocating shafts moves back toward the reservoir, the expandable means on the end of the shaft contracts and such gate with the respective conduit is closed to prevent aggregate from returning to the area of the respective reciprocating shaft. Each of the plurality of conduits is merged or joined into one single conduit some distance from their respective reciprocating shafts, and the aggregate from each of the conduits is moved through the single conduit to desired horizontal and/or vertical locations.

The expandable means and/or gates of the present invention include an inner sheath of expandable material, a plurality of flexible reinforcing hard members and an outer sheath of expandable material, if desired.

3,749,522

PREVENTION OF INFILTRATION OF GAS BUBBLES INTO SLURRY PUMP PARTS

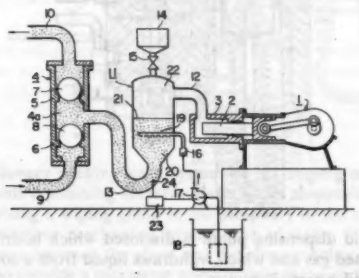
Toshio Kazama, and Kazunori Sek, both of Nagaoka, Japan, assignors to Tamagawa Kikai Kinzoku Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 19, 1971, Ser. No. 134,945

Claims priority, application Japan, Sept. 21, 1970, 45/82838

Int. Cl. F04b *9/08*; **B65d** *53/06*; **F16j** *15/14*

U.S. Cl. 417—54 **19 Claims**



In a slurry pump of liquid-diaphragm type having a diaphragm chamber containing a portion of slurry being pumped and a lighter diaphragm liquid, gas bubbles existing in large concentration in the slurry are prevented from infiltrating into the diaphragm chamber by the injection of a seal liquid without bubbles into the slurry in the chamber to cause a flow of liquid counter to the direction of infiltration of the gas bubbles. For this purpose, a seal-liquid-injection pipe is installed in the slurry in the chamber and supplied by a pump with the seal liquid from a reservoir through a check valve.

3,749,523

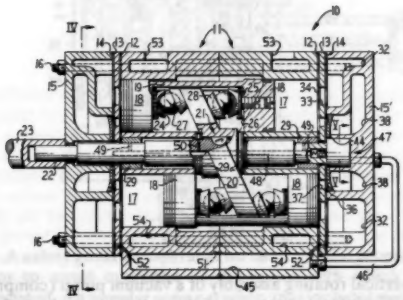
SWASH PLATE GAS COMPRESSOR

Thomas V. Wahl, Jr., North Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1971, Ser. No. 212,083

Int. Cl. F04b *1/12*

U.S. Cl. 417—269 **11 Claims**



A gas compressor comprises substantially identical cylinder block heads having interconnected fluid passages cast therein. A plurality of pistons, reciprocally mounted in the cylinder blocks, each have a thrust bearing shoe adjustably mounted thereon. A swash plate reciprocates each piston through a ball bearing which engages a respective bearing shoe.

3,749,524

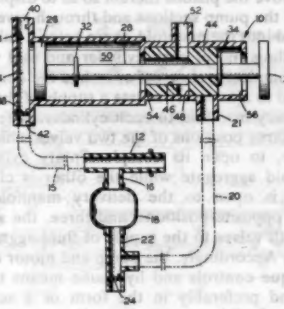
MANUALLY OPERATED PUMP UTILIZING BACKPRESSURE FOR EASEMENT OF PUMP STROKE

Donald J. Jordan, 113 Evergreen Ln., Glastonbury, Conn.

Filed Jan. 3, 1972, Ser. No. 215,040

Int. Cl. F04c *9/00*

U.S. Cl. 417—323 **8 Claims**



Diving apparatus employing a hand operated pump is disclosed. The apparatus is characterized by a hand operated pump for supplying air to a user consisting of a chamber provided with a piston which is connected via piston rod to a handle and a slide valve is associated with the piston rod. The slide valve is provided with passages or grooves which, with the valve in its innermost position, provide communication between a discharge port and the region between the valve and piston (back side of piston); and with the valve in its outermost position, provide communication between an inlet port and the back side of the piston. The chamber is also provided with second inlet and discharge ports at a point most remote from the slide valve, whereby fresh air is directed to the user via second inlet and discharge ports, and exhausted air is directed through a flexible hose and then to the back side of the pump piston pressurizing the same thereby balancing the piston load and reducing the effort required to stroke the pump.

3,749,525

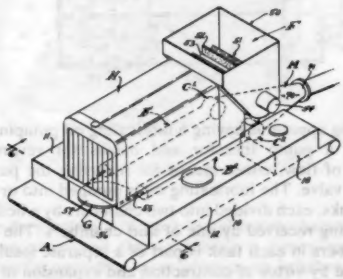
HYDRAULICALLY OPERATED FLUID AGGREGATE PUMP

David W. Hooper, 617 N. Hillside, La Habra, Calif., and Paul S. Putnam, 16238 Summershade Dr., La Mirada, Calif.

Continuation-in-part of Ser. No. 766,137, Oct. 9, 1968, abandoned. This application Aug. 3, 1970, Ser. No. 60,292

Int. Cl. F04b *35/00, 41/06, 39/08*

U.S. Cl. 417—318 **19 Claims**



A pump for fluid aggregate and the like, characterized by its reciprocating action conductive to substantially continuous delivery of fluid aggregate under pressure. A feature of the invention is the combining therein of a single acting duplex

pump with a single acting duplex motor, there being a pair of pistons coupled by means of a tension element that returns one piston upon advance of the other, the two pistons being dependently operable in a pair of cylinders adapted to deliver fluid aggregate into a common manifold. The two cylinder and piston units involve cooperatively related pump sections and motor sections, with the tension element extending between the motor sections. The two motor sections of the two cylinders are alternately charged with hydraulic operating pressure in order to move the pistons therein so as to displace fluid aggregate from the pump sections and through reversely operable valves and into the manifold, there being a valve at the aggregate handling end of each cylinder and said valves being adapted to completely close off or isolate the complementary cylinders, and to alternately isolate a supply of fluid aggregate and the delivery manifold to each cylinder. A feature of the pump is the three positions of the two valves which move oppositely; one, to open its complementary cylinder to the supply of fluid aggregate while the other is closed in this respect and is open to the delivery manifold; two, the reciprocably opposite positions; and three, the simultaneous closing of both valves to the supply of fluid aggregate and to the manifold. Accordingly, the pump and motor combination includes unique controls and hydraulic means to effect the foregoing, and preferably in the form of a self-sustaining system or unit, flexible as to stroke and power application and adaptable to a wide range of fluid aggregate viscosity; that is for example, adapted to pump "low slump" as well as "high slump" concrete.

3,749,526

PUMPING APPARATUS WITH TWO SEPARATED FLUID SYSTEMS

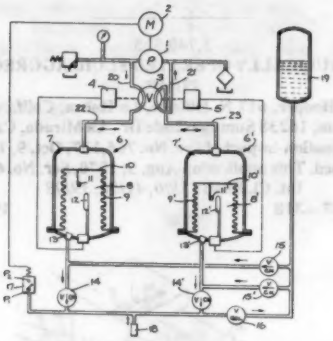
Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societe per Azioni, Milan, Italy

Filed May 20, 1971, Ser. No. 145,421

Claims priority, application Italy, May 23, 1970, 25004 A/70

Int. Cl. F04b *9/08, 17/00, 35/00*

U.S. Cl. 417—390 **7 Claims**



Pumping apparatus having a lubricating oil pumping circuit including a pump therefor and means for reversing the direction of flow, either means for reversing the pump or a reversing valve. The lubricating oil is pumped into or out of a pair of tanks, each divided into two chambers by a bellows and the oil being received by one of said chambers. The other of the chambers in each tank is part of a separate insulating oil circuit and by virtue of contraction and expansion of the bellows, pumps the insulating oil through check valves into a cable, compensating insulating oil being supplied from a storage tank through check valves to the other chambers and excess insulating oil being returned to the storage tank through an over pressure valve.

3,749,527

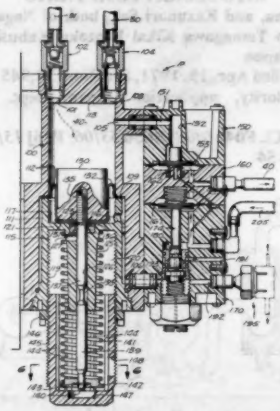
POSITIVE DISPLACEMENT PUMP FOR DISPENSING A METERED QUANTITY OF LIQUID

William E. Slagle, Barrington, Ill., assignor to Lincoln-Hall Research Company, Lincolnwood, Ill.

Filed Mar. 16, 1972, Ser. No. 235,153

Int. Cl. F04b *43/10, 45/06*

U.S. Cl. 417—395 **12 Claims**



A liquid dispensing pump is disclosed which is driven by compressed gas and which withdraws liquid from a source of supply under partial vacuum.

The pump includes means for positively purging the driving gas at the end of the dispensing stroke, so that the pump will quickly be ready for another dispensing action if desired.

The pump includes a provision for volume adjustment, and the volume adjustment mechanism includes a special anti-rebound feature.

3,749,528

VACUUM PUMPS

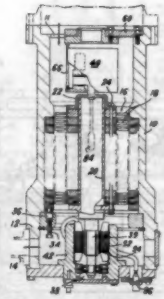
Marcel-Gustave Rousseau, Saint-Denis, and Robert Berthoumieux, Paris, both of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, and Commissarial A L'Energie Atomique, Paris, France

Filed Mar. 25, 1971, Ser. No. 127,951

Claims priority, application France, Apr. 1, 1970, 7011571

Int. Cl. F04b *17/00;* **F01d** *1/36;* **F16c** *35/00*

U.S. Cl. 417—424 **13 Claims**

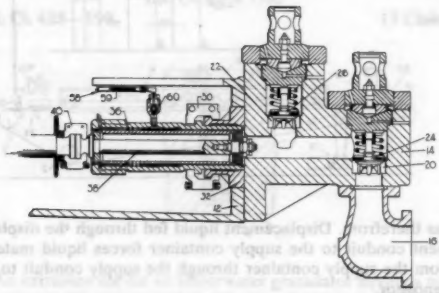


The vertical rotating assembly of a vacuum pump (comprising a turbomolecular rotor and the rotating member of an electric driving motor located under the rotor) is centered by a magnetic bearing located above the pump rotor and is supported by a ball bearing assembly located under the rotor and the motor. The ball bearing assembly is so constructed or connected to the pump housing as to tolerate radial deflection of the rotor.

3,749,529
PLUNGER PACKING WASH SYSTEM

David J. Cornelsen, Grainesville, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 16, 1971, Ser. No. 115,239
Int. Cl. F01b 31/00
U.S. Cl. 417—437 6 Claims

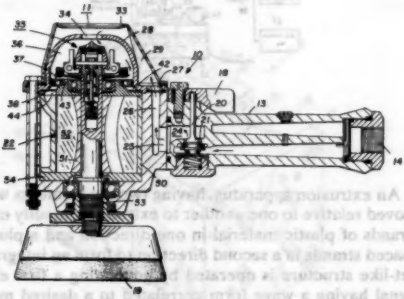


A plunger packing wash system for a pumping mechanism for fluids containing abrasive materials in suspension therein comprising a wiping gland in the periphery of the cylinder of the pumping mechanism around the plunger, the annular clearance between the gland and the plunger being controlled so as to provide a maximum velocity flow at the surface of the plunger, at least one annular chamber in the wiping gland, open pore foam in at least one of the annular chambers, and a source of wash liquid at a pressure greater than the suction pressure of the pump communicating with the wiping gland on the intake or suction stroke of the plunger.

3,749,530
GOVERNOR FOR PNEUMATIC MOTOR

German Amador, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 24, 1972, Ser. No. 220,252
Int. Cl. F01c 21/12
U.S. Cl. 418—41 14 Claims

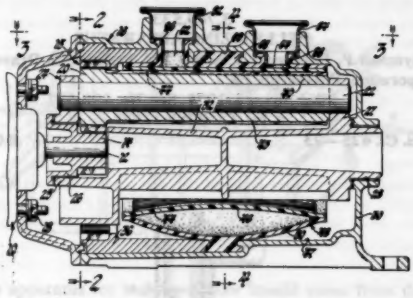


A safety governor operable on failure of the primary governor to arrest operation of the motor with which it is associated. An annular spring-washer, that includes weights supported peripherally distributed about its face, is secured to the drive spindle proximately displaced opposite inlet air passages to the motor. In response to centrifugal forces of rotation, the weights bend or deflect the spring-washer in an axial direction increasingly toward the inlet air passages until, at a predetermined overspeed, passage closure is effected interrupting air supply to the motor.

3,749,531
REVERSIBLE FLUID UNIT

Frank H. Walker, Grand Blanc, and Gary M. Kantrud, Flint, both of Mich., assignors to General Motor Corporation, Detroit, Mich.

Filed Dec. 2, 1971, Ser. No. 204,154
Int. Cl. F01c 5/00
U.S. Cl. 418—45 11 Claims

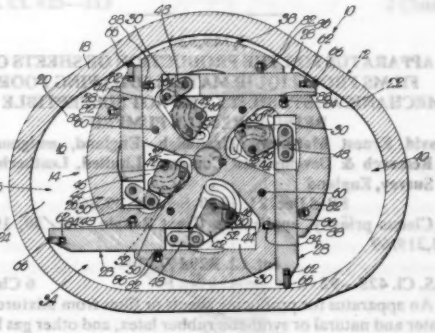


This unit may be employed as a reversible fluid pump or motor and has a housing for an orbiting rotor operatively disposed within the inner diameter of an annular fluid conducting bladder assembly formed with arcuately spaced fluid inlet and outlet passages. The pump disclosed has a motor driven rotor that carries a plurality of arcuately spaced roller members which contact and squeeze inner and outer walls of the bladder assembly together so that sealed pockets are formed between the adjacent roller members that carry fluid in the orbital direction of the rotor. When the rotor is driven, fluid is drawn into the bladder assembly as the pockets form at the inlet port and is exhausted as they reach the outlet port.

3,749,532
INTERNAL SEAL FOR ROTARY ENGINE

Ralph A. Privee, 746 N. 19th Ave., Hollywood, Fla., and Ronald E. Wilchynski, 25 Greenhill Ln., Cheshire, Conn.

Filed Sept. 27, 1971, Ser. No. 183,828
Int. Cl. F01c 19/00; F04c 15/00, 27/00
U.S. Cl. 418—137 2 Claims



In a rotary engine with an internal casing chamber, and an operating rotor unit therein having a rotary carrier with guideways for operating vanes which move in follower relation with the peripheral chamber wall and, together with the carrier, divide the chamber into successive compartments, an internal seal comprising an end sealing strip and opposite side sealing strips in each vane spring-urged into sealing contact with the adjacent chamber walls, with the side sealing strips on each vane extending within the longitudinal confines of its

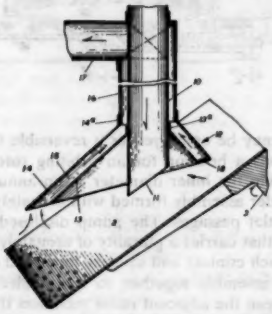
guideway, opposite transverse sealing strips in each guideway spring-urged into sealing contact with the confronting halves of the vane therein and with the side sealing strips in the latter, and further sealing strips in the opposite sides of the carrier spring-urged into sealing contact with the adjacent sidewalls of the chamber and being in sealing continuity with the other sealing strips in blocking all leakage paths between the compartments.

3,749,533

PELLETIZING APPARATUS

Raymond P. Lombardi, Crafton, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1971, Ser. No. 198,687
Int. Cl. B28b *17/00*
U.S. Cl. 425—73 **8 Claims**



A pelletizing disk supplied with feed material falling by gravity through a duct has a hood over a portion of the disk over the area from which the dust arises with a suction opening at the periphery of the disk arranged to collect only that dust that tends to escape from under the hood at a distance remote from the place where the feed material falls onto the disk. The hood is formed of spaced upper and lower cones with the suction opening being formed between the upper and lower cones. A suction pipe leads from the space between the two cones. Part of the suction opening nearest the feed pipe may be blocked off.

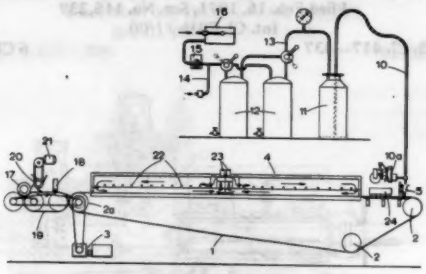
3,749,534

APPARATUS FOR THE PRODUCTION OF SHEETS OR FILMS FROM LIQUID MATERIAL HAVING POOR MECHANICAL STABILITY AND NOT SUSCEPTIBLE OF BEING DIRECTLY PUMPED

David Ernest Matthews, Cranleigh, England, assignor to Research & Development Company Limited, Leatherhead, Surrey, England

Filed Dec. 21, 1970, Ser. No. 99,869
Claims priority, application Great Britain, Dec. 30, 1969, 63,219/69
Int. Cl. B29d *7/20*
U.S. Cl. 425—92 **6 Claims**

An apparatus for producing sheets or films from mixtures of water and natural or synthetic rubber latex, and other gas having poor mechanical stability and therefore not susceptible of being directly pumped. A conveyor is arranged to receive the liquid mixture from a depositor having a linear outlet extending transversely of the conveyor. The conveyor is arranged to pass through a heating chamber after it has received the liquid mixture. The depositor is fed with liquid from a supply container, a supply conduit extending from the lower part of the container to the depositor. A displacement conduit extends between the upper part of the supply container and a displacement reservoir. The displacement gas reservoir is arranged to receive a supply of a displacement gas under pressure and a displacement liquid supply reservoir is arranged to supply displacement liquid to the displacement gas reservoir, to displace



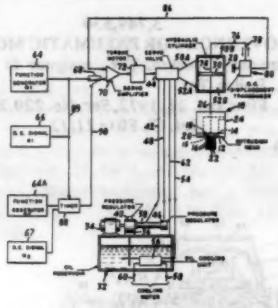
gas therefrom. Displacement liquid fed through the displacement conduit to the supply container forces liquid material from the supply container through the supply conduit to the depositor.

3,749,535

APPARATUS FOR EXTRUSION OF PLASTIC NET

Bernard J. Gaffney, Stillwater, and Ronald L. Larsen, Minneapolis, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Division of Ser. No. 877,686, Nov. 18, 1969, abandoned. This application Oct. 14, 1971, Ser. No. 189,107
Int. Cl. B29c *17/00*
U.S. Cl. 425—150 **4 Claims**



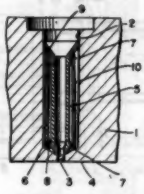
An extrusion apparatus, having two die members which are moved relative to one another to extrude a plurality of spaced strands of plastic material in one direction and a plurality of spaced strands in a second direction to form an integral net or net-like structure is operated by generating a first electrical signal having a wave form correlated to a desired motion of the die members, monitoring the actual motion of the die members and generating a second electrical signal having a wave form corresponding thereto, comparing the first and second signals and generating a variable third signal adjusted to compensate for detected differences between the first and second signals, and transmitting the third signal to a torque motor-servo valve combination which controls flow of oil to a hydraulic cylinder piston assembly operatively connected to one or both of the die members for carrying out the desired motion thereof. The motion is carried out with a high order of precision and reproducibility enabling the extrusion of a wide variety of sizes and shapes of plastic net or similar structures.

3,749,536

EXTRUSION DIE FOR UNDERWATER GRANULATOR

Horst Pawel Remscheid, and Friedrich Ruppel, both of Wuppertal-Langerfeld, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 28, 1971, Ser. No. 212,947
Claims priority, application Germany, Dec. 28, 1970, G 70 47 959.3
Int. Cl. B29c *1/00*
U.S. Cl. 425—190 17 Claims



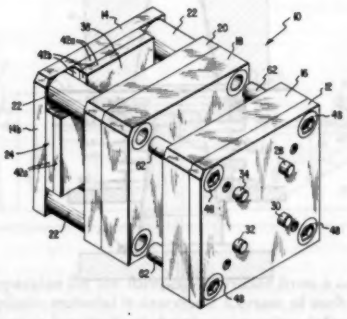
An extrusion die for an underwater granulator having a nozzle plate at the face end of the die containing extrusion nozzle bores used for conducting and extruding a hot molten thermoplastic polymer into a cooling medium such as water where the extruded material immediately solidifies and is granulated by a cutter arranged close to the die face, each nozzle bore being provided with at least two axially fixed tubular liners in concentric and radially spaced positions, the innermost liner being a metal tube, and heat insulating means located between at least the outermost tubular liner and the wall of each nozzle bore.

3,749,537

MOLD BASE FOR INJECTION MOLDING APPARATUS

Ferdinand J. Schriever, Monroe, Conn., assignor to Schriever Design Co., Inc., Shelton, Conn.

Filed June 4, 1971, Ser. No. 149,958
Int. Cl. B29f *1/12, 1/14*
U.S. Cl. 425—242 4 Claims



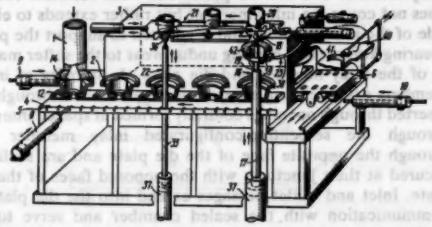
A mold base for injection and other types of molding apparatus including mold plates, ejector plates and end plates, in which the ejector plates include a body portion and a plurality of tabs extending one from each side of the body portion and each extending between different pairs of sleeves which are situated in assembly to separate the mold plates from the end plates.

3,749,538

APPARATUS FOR MAKING HOLLOW MOULD CORES

Viktor Ivanovich Rudnev, oblasti, Novomytischinsky prospekt, 80, korpus 2, kv. 74, Mytischi Moskovskoi, and Vladimir Ivanovich Rudnev, oblasti, proezd Vorovskogo, 7, kv. 47, Kaliningrad Moskovskoi, both of U.S.S.R.

Filed Apr. 20, 1971, Ser. No. 135,720
Int. Cl. B28b *5/04*
U.S. Cl. 425—261 7 Claims



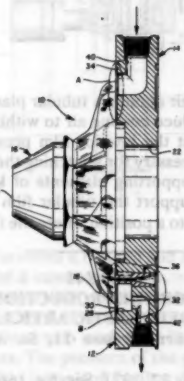
An apparatus for making hollow mould cores from thermosetting mixtures having a core box provided with inserts limiting the thickness of the walls of the core. One of these inserts is placed onto the bottom of the box and consists of a disk with an opening coaxial to the opening in the bottom of the box, while the other, central insert, has a tail entering the opening in the bottom of the box through the opening in the disk to allow the central insert to be set coaxially to the box, in which case the drive bar is arranged in a vertical position and provided with two supports which during the movement of the bar upwards disconnect the inserts and set them at different levels by height. Arranged at the levels of the supports during the maximum protrusion of the bar are devices which during the back stroke of the bar remove the central insert and core from the bar supports and then transfer the central core into the core box.

3,749,539

UNDERWATER PELLETIZER DIE PLATE

Paul J. Galbreath, Kingsport; Albert E. Spaller, Johnson City, and Bruce W. Stockbridge, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1972, Ser. No. 247,542
Int. Cl. B29f *3/08*
U.S. Cl. 425—313 2 Claims



Improved die plate for underwater extrusion pelletizer apparatus and method for making, wherein the die plate, essentially integral, defines on its extrusion face a first recessed surface extending around the die plate, a serpentine recessed

channel within and deeper than the first recessed surface and extending nearly around the die plate, and a shoulder surrounding the serpentine recessed channel adjacent the first recessed surface. A thin inlay member seats over the serpentine channel and against the shoulder in sealing relation to provide with the serpentine channel a sealed chamber adapted to conduct a heated fluid nearly around the die plate. The first recessed surface is filled to the surface level of the inlay member and the face of the die plate with a wear resistant coating material of harder material than the material of the inlay member and the die plate. The wear resistant coating does not cover the inlay member but rather extends to either side of the inlay member and is adapted to support the pellet shearing knives from causing undue wear to the softer material of the inlay member and die plate. A plurality of insert members each defining an extrusion orifice therethrough are inserted through openings centrally formed at spaced intervals through the serpentine-configurated inlay member and through the opposite face of the die plate and are sealingly secured at their junctures with the opposed faces of the die plate. Inlet and outlet passages extend into the die plate in communication with the sealed chamber and serve to introduce into and remove from the sealed chamber a fluid heating medium for circulation along the serpentine channel entirely around each of the insert members.

3,749,540

APPARATUS FOR AIR-COOLING A TUBULAR PLASTICS FILM BLOWN BY A BLOWHEAD

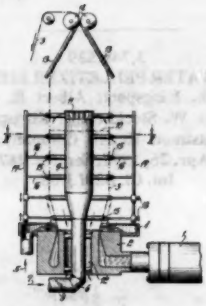
Hartmut Upmeier, Tecklenburg, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Sept. 29, 1970, Ser. No. 76,394

Claims priority, application Germany, Oct. 8, 1969, P 19 50 758.5; Feb. 3, 1970, P 20 04 088.1

Int. Cl. B29d 7/02

U.S. Cl. 425—326 **13 Claims**



An apparatus for air cooling a tubular plastic film blown by a blowhead to introduce cooling air to within the tubular film at a pressure so that the interior film pressure exceeds the blowing pressure necessary for stretching the film in its plastic state. Mechanical supporting elements of low coefficient of friction externally support the tubular film issuing from the blowhead at least up to a position where the film has solidified.

3,749,541

APPARATUS FOR THE PRODUCTION OF BLOW MOLDED PLASTIC ARTICLES

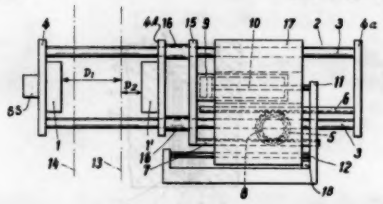
Johannes Mehnert, Ernststrassee 11, St. Augustin-Menden, Germany

Filed July 27, 1971, Ser. No. 166,356

Int. Cl. B29d 23/03

U.S. Cl. 425—326 **21 Claims**

The transporting mechanism for the mold sections in a blow molding apparatus has horizontal tie rods which are rigidly connected with one mold section and reciprocably guide the other mold section. The tie rods are parallel to the barrel of the plasticizer which is mounted at a level above the transporting mechanism. A frame of the transporting mechanism guides a housing which reciprocably supports the tie rods and is confined to reciprocatory movements in parallelism with the tie rods. A double-acting hydraulic cylinder is connected with the



other mold section and with the frame to move the other mold section relative to the tie rods as well as to move both mold sections from registry with the extruding head of the plasticizer to a blowing station or vice versa. A system of racks and pinions can move the tie rods and the housing relative to the other mold section in response to actuation of the double-acting cylinder.

3,749,542

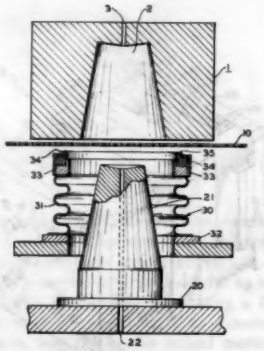
SEALING CONSTRUCTION FOR USE IN FORMING ARTICLES FROM STYRENE SHEET

Richard K. Shelby, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 795,750, Sept. 26, 1968, abandoned, which is a division of Ser. No. 534,441, March 15, 1966, Pat. No. 3,458,903. This application Mar. 17, 1971, Ser. No. 125,437

Int. Cl. B29c 1/02

U.S. Cl. 425—388 **3 Claims**



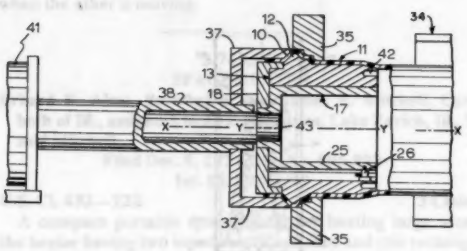
A pressure sealing ring which is adapted to be mounted upon rigid retaining rings in pressure applicators used in molding operations where the retaining ring receives gaseous pressure. The sealing ring comprises a linear copolymer of approximately 55 to 65 weight percent of vinylidene fluoride and approximately 45 to 35 weight percent hexafluoropropylene. The sealing ring engages a soft heated thermoplastic material and when gaseous pressure is applied to the retaining ring, a portion of the sealing ring moves radially outwardly to stretch the hot thermoplastic material.

3,749,543

APPARATUS FOR FORMING BELLED PIPE COUPLINGS

Patrick H. Stansbury, Spokane, Wash., assignor to ASC Industries, Inc., Spokane, Wash.

Filed June 21, 1971, Ser. No. 154,897
Int. Cl. B29c 17/00
U.S. Cl. 425—393 8 Claims



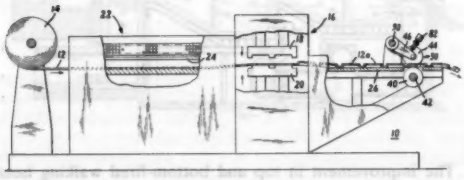
An apparatus for forming a plastic pipe bell end of predetermined inner configuration including a peripheral groove for receiving a sealing gasket. The apparatus includes a segmented die having four axial members and a center core element. The die is inserted into the heated end of a length of plastic pipe to permit the pipe to be molded about the die in the desired configuration. After cooling of the pipe, the core element is removed and the axial members are disassembled within the pipe and retracted. The disclosed method relates to the insertion of the die having the desired interior pipe configuration, the cooling of the pipe about the die, and the progressive removal of the core and die elements.

3,749,544

PREFORM RESHAPING MEANS HAVING WEB DISTORTION CONTROL DEVICE

Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

Int. Cl. B29c 17/04
U.S. Cl. 425—397 10 Claims



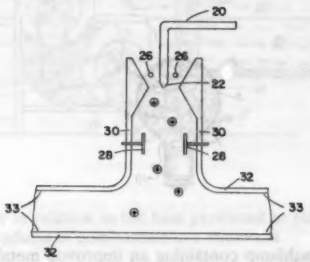
An apparatus for the forming of articles from a continuous web of plastic material is described. Certain of such materials are subject to longitudinal shrinkage, causing deformation of the finished articles, and means are provided for applying longitudinal tensions to the web to counteract the shrinkage effect. The tensioning means comprise a plurality of roller pairs spaced transversely across the path of the web, each pair adapted to frictionally engage the web. The roller speeds are adjusted to exert a constant tension on the web as it is incrementally or intermittently indexed through the forming apparatus and compensate for the deformation resulting from shrinkage.

3,749,545

APPARATUS AND METHOD FOR CONTROLLING LIQUID FUEL SPRAYS FOR COMBUSTION

Henry R. Velkoff, Worthington, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed Nov. 24, 1971, Ser. No. 201,794
Int. Cl. F23b 7/00
U.S. Cl. 431—2 5 Claims



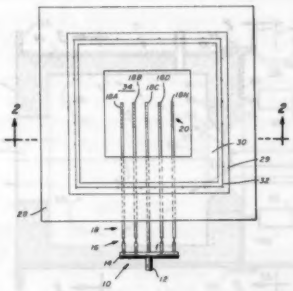
A method and apparatus for increasing the efficiency of combustion by controlling liquid fuel sprays characterized by electrostatically influencing the size distribution and trajectory of liquid fuel droplets introduced into the combustion chamber. The liquid fuel spray, the walls of the combustion chamber and any ducting associated therewith are electrostatically charged by appropriately positioned electrodes to influence a fuel droplet-air contact which tends to maximize combustion efficiency and hence reduce air pollution.

3,749,546

SMOKELESS FLARE PIT BURNER AND METHOD

Robert D. Reed; John Smith Zink, and Hershel E. Goodnight, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Sept. 20, 1971, Ser. No. 182,008
Int. Cl. F23d 13/20
U.S. Cl. 431—5 13 Claims



This invention involves a method and apparatus for smokeless combustion of a combustible gas, which is supplied at a flow rate which varies widely from a low to a high value. It involves dividing the total flow rate through a manifold into a plurality of flow lines with each flow line providing gas to a plurality of burners. The pressure of the gas in the manifold is measured and valves in each of the flow lines are controlled as a function of the manifold pressure, so that they open, one at a time, as the flow increases, thereby supplying gas to each flow line and to its burners at a much narrower range in flow rate. Thus the velocity of the gas is always high enough to get proper air mixing and smokeless combustion.

3,749,547

FLASHLAMP WITH IMPROVED COMBUSTIBLE FOIL

Eric Gregory, Bernardsville; William G. Marancik, Basking Ridge, and Walter Shattes, Bloomfield, all of N.J., assignors to Airco, Inc., Murray Hill, New Providence, N.J.

Filed Sept. 9, 1971, Ser. No. 178,978
Int. Cl. F21k 5/02
U.S. Cl. 431—95 7 Claims

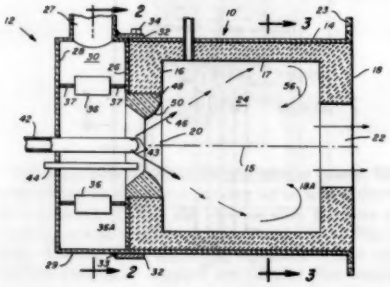
A photo flashlamp containing an improved metallic combustible foil composite comprising a layer of a pyrophoric metal, for example, yttrium, interposed between two layers of nonpyrophoric metal, wherein nonpyrophoric metals such as aluminum, hafnium, magnesium or the like may be used. A method for making a metallic combustible foil composite comprising depositing, in a vacuum chamber, a layer of pyrophoric metal on a layer of combustible nonpyrophoric metal and then depositing a layer of combustible nonpyrophoric metal on the exposed surface of the pyrophoric metal layer.

3,749,548

HIGH INTENSITY BURNER

John S. Zink; Robert D. Reed, and Hershel E. Goodnight, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed June 28, 1971, Ser. No. 157,121
Int. Cl. F23r 1/02
U.S. Cl. 431—158 5 Claims



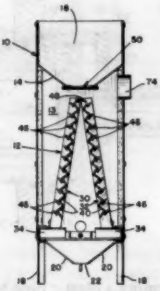
A combustion chamber is provided in the form of a cylindrical chamber with a circular inlet opening in a first end wall and a circular outlet opening in the second end wall. Air enters under pressure into a circular plenum with a plurality of angular vanes or nozzles adapted to give the air flow a tangential motion, forming a helical vortex of flow into the chamber. Fluid fuel is sprayed into the chamber in the form of a wide-angle conical surface, where it is mixed with the air and burned. The helical flow combined with the restriction of the second end wall of the outlet provides long residence time and complete combustion of the fuel-air mixture.

3,749,549

CONTINUOUS HEATING APPARATUS FOR GRANULAR MATERIAL

Barry C. Henderson, 2760 Westridge Rd., Winston-Salem, N.C.

Filed Jan. 31, 1972, Ser. No. 221,963
Int. Cl. F27b 1/00; F26b 17/12
U.S. Cl. 432—49 12 Claims



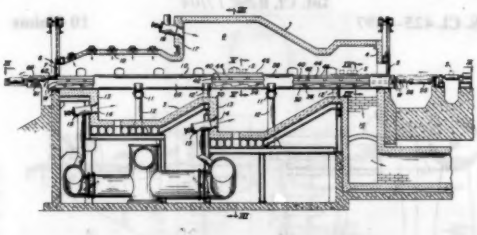
The apparatus includes a heating chamber having a heat exchanger located therein provided with a series of angularly disposed plates, heated directly by a flame, that gives a cascade effect on sand falling thereover. Thermostats are provided within the heat chamber and at the sand discharge opening for controlling the temperature of the sand. An adjustable sand flow control arrangement directs sand at a constant rate to the heat exchanger.

3,749,550

WALKING BEAM FURNACE

Walter Suydam, Mt. Lebanon Twp., Allegheny County, Pa., assignor to Loftus Engineering Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1971, Ser. No. 208,846
Int. Cl. F27d 3/12
U.S. Cl. 432—122 18 Claims



The improvement in top and bottom-fired walking beam furnaces wherein the lower burners, like the top ones, fire opposite to the direction of travel of the work pieces from the charging to the discharge end of the furnace. This is accomplished by the use of a plurality of parallel walking beam assemblies, each of which has two spaced stationary water-cooled beam sections having a supporting rail along the top. The bottoms of these side pieces are rigidly integrated through a bottom water-cooled beam section. There is an idler beam section supported for longitudinal motion above the bottom beam section, longitudinal travel of which in one direction raises the idler section and in the opposite direction lowers it. There is a longitudinally-movable traversing beam section having a load-traversing rail at its top which is lifted above the support rails on the side beam members when the idler beam

raises, but which is normally lower than the support rails. After the traversing beam is raised it is moved longitudinally toward the discharge end of the furnace and when it is lowered it is returned to its normal position. Combined tie rods and spacers at intervals along the assembly connect the upper portions of the side beam sections so that the girder is in effect a box section within which are the walking beam elements. Mechanism outside the furnace at one end moves the idler beam section and at the opposite end moves the traversing beam member, and each holds its beam against endwise travel when the other is moving.

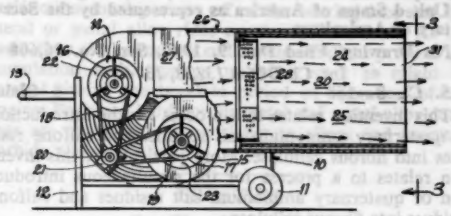
3,749,551

SPACE HEATER

Erhard E. Alms, Barrington, and James E. Mitchell, Cary, both of Ill., assignors to AFE Industries, Lake Zurich, Ill., by said Mitchell

Filed Dec. 8, 1971, Ser. No. 205,982
Int. Cl. F23l *5/02*
U.S. Cl. 432—222 **3 Claims**

A compact portable space heater for heating large areas, the heater having two input centrifugal fans and one rectangular output duct to provide a flow of uniformly heated air in the output duct. The fans are disposed one above the other to provide a narrow profile such that the heater can be wheeled through an average hinged door, the vertical disposition of the fans also contributing to the evenness of the heat distribution across the output duct. A large volume of air is provided for the burner in relation to the heat produced to reduce the unburned products of combustion to a minimum.



ERRATUM

For Class 432—58 see:
Patent No. 3,749,382

3,749,552

SIMULTANEOUS INTRODUCTION OF QUATERNARY AMMONIUM SALT RESIDUES AND SULFONE RESIDUES INTO FIBROUS CELLULOSE

Stanley P. Rowland, New Orleans, La., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Dec. 9, 1970, Ser. No. 96,608
Int. Cl. D06m *13/28, 13/46*
U.S. Cl. 8—188 1 Claim

This invention relates to a process for the introduction of quaternary ammonium salt residues and sulfone residues into fibrous cellulose. More particularly, this invention relates to a process for the simultaneous introduction of quaternary ammonium salt residues and sulfone residues into fibrous cellulose.

3,749,553

MODIFICATION OF WOOL WITH VINYLPYRIDINE AND ZINC CHLORIDE

Nathan H. Koenig, Albany, and Mendel Friedman, Moraga, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Dec. 1, 1971, Ser. No. 203,883
Int. Cl. D06m *3/02, 13/36*
U.S. Cl. 8—127.6 2 Claims

Wool is modified, in the absence of added water, by reaction with an aromatic heterocyclic compound having a vinyl group attached to the heterocyclic ring (e.g., vinylpyridine) and zinc chloride at elevated temperatures. The reagents are applied to the wool in a suitable organic solvent. The so-modified wool is much more resistant to laundering shrinkage than is normal wool.

3,749,554

METHOD FOR REDUCING EROSION AND CORROSION OF METAL SURFACES

Paul W. Fischer, Whittier, George P. Maly, Newport Beach, and Delbert E. Pyle, Simi Valley, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Original application June 8, 1970, Ser. No. 44,661, now Patent No. 3,653,452. Divided and this application Sept. 1, 1971, Ser. No. 177,180
Int. Cl. C23f *11/00, 11/02*
U.S. Cl. 21—2.5 R 13 Claims

Erosion and corrosion of metal surfaces exposed to a flowing stream of hot gases containing dispersed particles of solid material are reduced by introducing into the flowing stream an additive that decomposes at the temperature and pressure of the gas to release ammonia or a vaporous amine and form a resinous residue. The additive is preferably introduced into the gas in an inert carrier liquid.

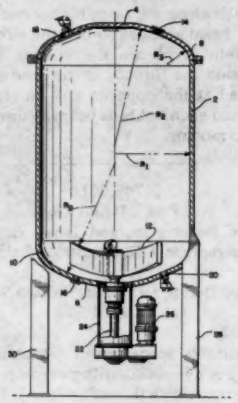
3,749,555

POLYMERIZATION REACTOR

Günter Beckmann, Johannes Dietrich, and Kurt Pfeiffer, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation-in-part of abandoned application Ser. No. 13,721, Feb. 24, 1970. This application Nov. 29, 1971, Ser. No. 203,060
Claims priority, application Germany, Mar. 1, 1969, P 19 10 482.6
Int. Cl. C08f *1/98*
U.S. Cl. 23—285 4 Claims

Agitator equipped reactors particularly useful for the suspension polymerization of 1-butene having a radius of curvature of the cylindrical internal wall surface of 1600 to 2750 mm., a radius of curvature of the bottom reactor



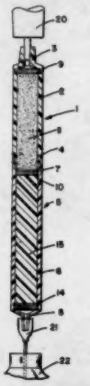
dome of 2560 to 4200 mm., and a radius of curvature of the bottom reactor flange of 495 to 700 mm.

3,749,556

RADIOPHARMACEUTICAL GENERATOR KIT

Morton Barak, Walnut Creek, and Harry S. Winchell, Lafayette, Calif., assignors to Medi-Physics, Inc.

Filed Aug. 19, 1971, Ser. No. 173,099
Int. Cl. A61k *27/04;* B01j *1/04*
U.S. Cl. 23—252 R 4 Claims



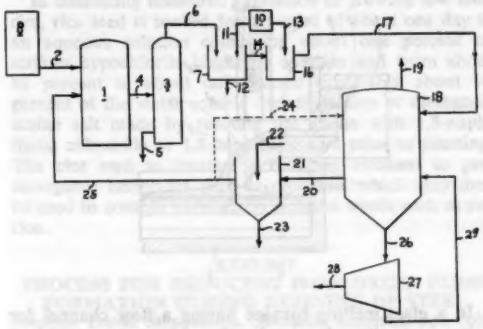
A kit readily assembled into essentially a packed chromatographic column for generating technetium-99m labeled pharmaceuticals in a simple two-step process. Technetium-99m pertechnetate in a first step is isolated and its valence state reduced by adsorption upon a reducing agent. Then the reduced technetium-99m in a second step is eluted from the reducing agent by combination with an immediately labeled biological compound, the eluant pH is adjusted and buffered to physiological levels and benign cations are substituted for uncombined reducing agent and isotope ions. A new technetium-99m labeled radiopharmaceutical useful in liver imaging is produced by interaction with the column packing in one specific aspect of the procedure.

3,749,557

METHOD OF PRODUCING TETRAALKYLLEADS

Ephraim A. Cuevas, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 13, 1970, Ser. No. 54,409
Int. Cl. C01d 11/02; B01d 11/02; C01g 21/00
U.S. Cl. 23—297 7 Claims



A process for reducing the lead content of lithium chloride solutions is described which involves dilution of aqueous lead chloride solutions to precipitate lead chloride crystals therefrom. In one embodiment the dilute solutions of lithium chloride produced in the precipitation step are used to quench reactor masses formed in the manufacture of alkyllead compounds.

3,749,558

NICKEL-COATED STEEL CORE WIRES AND CABLES

Jean-Paul Dillenschneider, Beaumont, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrant (Puy-de-Dome), France

Filed Feb. 8, 1971, Ser. No. 113,448
Claims priority, application France, Feb. 12, 1970, 7005091
Int. Cl. B60c 9/12
U.S. Cl. 29—191.6 10 Claims

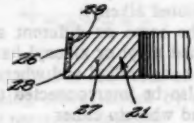
Wires and cables which are particularly useful in reinforcing rubber articles, such as tires, have a work-hardened nickel-containing coating upon a steel core.

3,749,559

PISTON RINGS WITH COATING IMPREGNATED WITH ANTIFRICTION AGENT

Herbert F. Prasse, Town and Country, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Original application Oct. 20, 1969, Ser. No. 867,632, now Patent No. 3,617,349. Divided and this application June 29, 1971, Ser. No. 157,930
Int. Cl. F02f 5/00
U.S. Cl. 29—191.2 11 Claims



A piston ring having a bearing face coated with a hard porous metal or metal alloy having its pores impregnated with a solid antifriction agent such as graphite. The porous metal or metal alloy has an open porosity ranging from about 7 to about 30% by volume of the outer surface of the coated bearing face, and the pore openings range from about 0.2 micron to about 10 microns, thereby being large enough to discharge the antifriction agent to the cylinder surface for long periods of time after the antifriction coating wears off of the bearing face and the metal or metal alloy rides on the cylinder wall. At the same time the pores are sufficiently small to prevent accumulation and trapping or debris such as might be formed during the break-in period of operation of the engine. Preferred hard porous metal and metal alloy coatings are molybdenum, molybdenum alloys and tungsten carbide alloys.

ERRATUM

For Class 29—199 see:
Patent No. 3,748,712

3,749,560

GASOLINE COMPOSITIONS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of abandoned application Ser. No. 856,147, Sept. 8, 1969. This application Aug. 21, 1970, Ser. No. 66,122
Int. Cl. C10l 1/06
U.S. Cl. 44—80 49 Claims

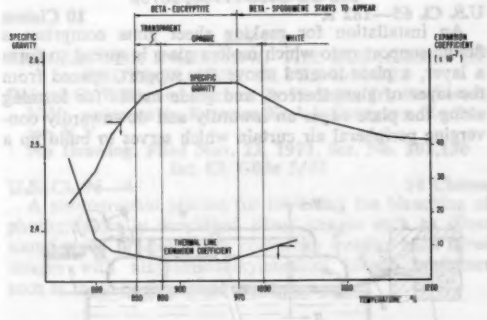
Gasoline compositions containing normally liquid non-aromatic olefin hydrocarbons having an average molecular weight of from 350 to about 1500; the composition are characterized by substantially reducing the underhead intake valve deposit formation when used as fuels in a spark ignition, internal combustion engine. Preferred olefin hydrocarbons are those prepared by Friedel-Crafts polymerization of a mixture of monoolefins with carbon numbers ranging from about C_{12} and higher.

3,749,561

METHOD OF PRODUCING CRYSTALLINE GLASS CONTAINING PORTIONS HAVING DIFFERENT CRYSTALLIZATION EXTENTS

Shigeo Kuwayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Continuation-in-part of application Ser. No. 41,546, May 28, 1970. This application Mar. 23, 1972, Ser. No. 237,292
Claims priority, application Japan, May 29, 1969, 44/42,238
Int. Cl. C03b 29/00; C03c 15/00
U.S. Cl. 65—33 2 Claims



A method for producing a crystalline glass article of the Li_2O-Al_2O_3-SiO_2 system having glass portions of horizontally different crystalline extents which comprises subjecting a transparent crystalline glass to a further crystallizing treatment in the production of a crystalline glass, forcibly cooling a portion of said transparent crystalline glass during the heat treatment, the other portion

of the transparent crystalline glass remaining uncooled whereby the portion remaining uncooled is with the difference between the specific gravity of the transparent crystalline glass portion and the opaque crystalline glass portion being less than 1.2% is disclosed.

3,749,562

METHOD FOR MAKING DRY REED SWITCHES

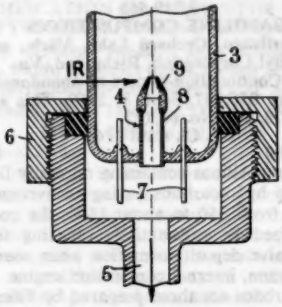
Michel Nicolas and Jacques Alison, Courbevoie, France, assignors to Compagnie Industrielle Francoise des Tubes Electroniques-CIFTE

Continuation of abandoned application Ser. No. 52,836, July 7, 1970. This application Mar. 15, 1972, Ser. No. 234,918

Claims priority, application France, July 15, 1969, 6923999

Int. Cl. C03b 29/00

U.S. Cl. 65—34 1 Claim



A dry reed switch is provided with a metal tube penetrating into one of the ends of the switch envelope and carrying at its end a small glass tube. The free end of this latter tube is susceptible of melting under the action of infrared rays so as to close the envelope of the switch after evacuation thereof.

3,749,563

INSTALLATION FOR MAKING SHEET GLASS

Valentin Stingelin, Aire, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge, Geneva, Switzerland

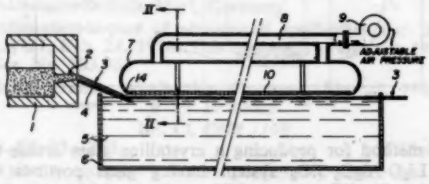
Filed Mar. 22, 1971, Ser. No. 126,789

Claims priority, application Switzerland, Mar. 24, 1970, 4,459/70

Int. Cl. C03b 17/00, 18/00

U.S. Cl. 65—182 R 10 Claims

An installation for making sheet glass comprises a fluidic support onto which molten glass is spread to form a layer, a plate located above the support, spaced from the layer of glass thereon, and guide means for forming along the plate edges an inwardly and downwardly converging peripheral air curtain which serves to build up a



pressurized air mattress between the plate and the layer. The compressive action of this mattress serves to reduce the thickness of the glass sheet to less than the equilibrium thickness that would otherwise be obtained.

3,749,564

GLASS MELTING FURNACE FLOW CHANNEL SUPPORT

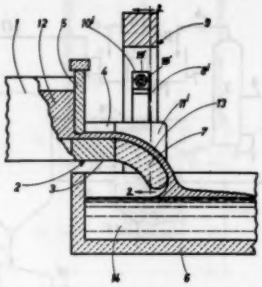
Edgard Brichard, Jumet, Belgium, assignor to Glaverbel S.A., Watermael-Boitsfort, Belgium

Filed May 5, 1971, Ser. No. 140,511

Claims priority, application Great Britain, May 7, 1970, 22,173/70

Int. Cl. C03b 17/00, 18/00

U.S. Cl. 65—184 19 Claims



In a glass melting furnace having a flow channel for delivering molten glass to glass forming apparatus, clamping means applying a horizontal clamping force to the sides of at least a portion of the channel floor for completely supporting that portion of the floor when the furnace is in use and thus eliminating the need for any medial support structure beneath, and between the sides of, the channel floor portion in the region where such support structure would require forced cooling.

3,749,565

HERBICIDES INCLUDING THIOCARBAMOYL-ALKYLAMINO-s-TRIAZINES

Werner Schwarze, Frankfurt am Main, and Wolfgang Weigert, Offenbach am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

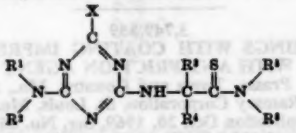
No Drawing. Original application Mar. 24, 1969, Ser. No. 810,036, now Patent No. 3,634,423, dated Jan. 11, 1972. Divided and this application Oct. 9, 1970, Ser. No. 79,623

Claims priority, application Germany, Mar. 22, 1968, P 17 70 027.5

Int. Cl. A01n 9/22

U.S. Cl. 71—93 7 Claims

Herbicides including an effective amount of substituted s-triazine compounds of the formula



(I)

wherein

X is halogen, N_3, lower alkoxy or lower alkylmercapto;

R^1 and R^2 are the same or different and are hydrogen, lower straight-chain or branched alkyl, lower straight-chain or branched alkenyl, lower straight-chain or branched substituted alkyl or lower straight-chain or branched substituted alkenyl;

R^3 and R^4 are the same or different and are straight-chain or branched alkyl or alkenyl having from 1 to 8 carbon atoms or are aralkyl and wherein

R^3 and R^4 may also be interconnected to form a 5 to 7 member ring and wherein either

R^3 or R^4 may also be hydrogen; and

R^5 and R^6 are the same or different and are lower alkyl or hydrogen.

The compounds are strong herbicides of a highly selective nature.

3,749,566

IMPROVING RESISTANCE OF RICE SEED TO PREEMERGENCE HERBICIDES

Otto L. Hoffmann, Shawnee, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 770,856, Oct. 25, 1968, now Patent No. 3,564,768. This application Feb. 8, 1971, Ser. No. 113,763
Int. Cl. A01n *9/12*
U.S. Cl. 71—100 3 Claims

In combating undesired vegetation in growing low land rice, rice seed is soaked for a period of about one day in an aqueous solution containing about one percent of sodium hypochlorite bleaching solution and from about ⅛ percent to about one percent preferably about ¼ percent of the water soluble dimethylamine or diethanolamine salt made by reacting the amine with 1,8-naphthalic anhydride or 1,8-naphthalic acid prior to planting. The rice seed so treated is rendered resistant to preemergence herbicides such as molinate, which may then be used to combat particularly noxious weeds such as red rice.

3,749,567

PROCESS FOR REDUCING IRON OXIDE FUME FORMATION DURING REFINING OF STEEL

Stephen David Stephenson, Sheffield, England, and John Rees Morgan Richards, Cardiff, Wales, assignors to National Research Development Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 792,800, Jan. 21, 1969. This application Jan. 11, 1971, Ser. No. 105,701
Claims priority, application Great Britain, Sept. 17, 1970, 44,413/70
Int. Cl. C21c *7/00*
U.S. Cl. 75—60 13 Claims

A process for the fumeless refining of steel in which a particulate metal oxide is suspended in a carrier gas, such as air, containing less than about 30% oxygen and at a ratio of less than about 3 cubic feet of gas per pound of oxide and injected into a molten ferrous bath at a rate sufficient to produce a rapid carbon boil in the bath.

3,749,568

STEEL SUITABLE FOR RAZOR BLADES

Bengt J. Kylberg and Lars Espen Wold, Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Feb. 16, 1971, Ser. No. 115,284
Claims priority, application Sweden, Feb. 23, 1970, 2,231/70
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 C 3 Claims

Steel for edged tools in the form of a thin strip material, the steel being characterized by a composition expressed in weight percent as follows:

	Percent
Cr	6–8
C	0.6–0.8
Mo	0.5–1.5
Si	0–2
Mn	0–2

3,749,569

ELECTRICAL RESISTANCE ALLOYS

Carrol Dean Starr, Whippany, Robert Steinitz, Montclair, and Teh Po Wang, North Caldwell, N.J., assignors to Wilbur B. Driver Company

No Drawing. Filed July 22, 1971, Ser. No. 165,318
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 2 Claims

Oxidation resistant electrical resistance alloys are disclosed that have a *nickel base* and contain from 0.5 to 5% by weight of silicon, and 0.01 and 0.04% by weight of calcium and from about 50 p.p.m. to 180 p.p.m. by weight of oxygen in the form of silicon dioxide (SiO_2) and calcium oxide (CaO) in the molar ratio SiO_2 to CaO of less than one. A method for making the alloy is disclosed. These alloys are electrical resistance alloys which have uniform long life under oxidizing conditions.

3,749,570

ALLOY FOR DENTAL USE

Richard L. Lyon, 6 Monterey Place, Alton, Ill. 62002

No Drawing. Filed May 26, 1971, Ser. No. 147,161
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 3 Claims

An alloy for use in dentistry comprising nickel, chromium, molybdenum, aluminum, beryllium and carbon; which alloy possesses physical properties adapting the same for effective replacement of the heretofore utilized gold and gold alloys. Said alloy is of marked strength while being relatively lightweight so as to provide relatively thin restoration devices while assuring of a precise and accurate fit.

3,749,571

COLD-PRESSED COMPOSITIONS

Donald Stibbs, Dorking, Clifford Gordon Brown, Fetcham, and Raymond Thompson, Esher, England, assignors to the United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,503
Claims priority, application Great Britain, Oct. 7, 1970, 47,744/70, 47,745/70, 47,746/70
Int. Cl. B22f *1/00*
U.S. Cl. 75—204 14 Claims

Hard, shaped bodies are made by sintering a cold-pressed compact of a boron-carbon compound which contains a densification aid selected from silicon, aluminum, magnesium, metal borides, and mixtures thereof.

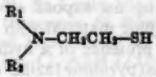
3,749,572

PROCESS FOR INHIBITING THE BLEACHING OF PHOTOGRAPHIC SILVER IMAGES

Roland G. Willis and Herbert E. Wabnitz, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 22, 1971, Ser. No. 201,150
Int. Cl. G03c *5/32*
U.S. Cl. 96—4 10 Claims

A photographic process for inhibiting the bleaching of photographically developed silver images such as silver sound track images which comprises treating such silver images with alkylaminoalkylenethiol bleach inhibitors such as those having the formula



wherein R_1 is an alkyl group or a cycloalkane group and R_2 is a hydrogen atom, a cycloalkane group or an alkyl group such that at least one of R_1 or R_2 has at least 3

carbon atoms and that the total number of carbon atoms in the bleach inhibitor molecule is 6 to 20 and preferably 8 to 16.

3,749,573

SILVER HALIDE PHOTOSENSITIVE ELEMENT CONTAINING HYDROPHILIC COLLOID LAYERS HARDENED WITH α,β-BIS-ACRYLOYLAMIDO-ETHYLENEGLYCOL

Alfred Froehlich, Marly-le-Grand, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Aug. 3, 1971, Ser. No. 168,783
Claims priority, application Switzerland, Aug. 11, 1970, 12,029/70
Int. Cl. G03c *1/30, 5/26*
U.S. Cl. 96—50 R 9 Claims

A hydrophilic colloid present in a photographic layer material is crosslinked with α,β-bis-acryloylamidoethyl-eneglycol or α,β-bis-methacryloylamido-ethyleneglycol.

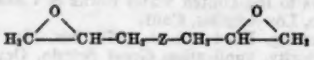
3,749,574

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE ELEMENTS

Robert Joseph Pollet, Vremde, Francis Jeanne Sels, Kontich, and Herman Adelbert Philippaerts, Mortsel, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Filed May 17, 1971, Ser. No. 144,235
Claims priority, application Great Britain, June 11, 1970 28,403/70
Int. Cl. G03c *1/06, 1/48, 5/30*
U.S. Cl. 96—66.3 20 Claims

A process is described for developing an exposed photographic silver halide element wherein the development is carried out in the presence of a water-soluble non-polymeric compound obtained by reaction of a bisepoxide of the formula:



Z being oxygen or the group —O—Y—O— wherein Y is a straight-chain or branched-chain C_2–C_8 alkylene group

with a monoalkyl or monoaryl ether of ethylene glycol or a polyoxyethylene glycol. The speed and developability of the silver halide element is substantially increased by the presence of this polyaddition compound. By infectious development of silver chloride and silver chlorobromide emulsions it is possible by means of these compounds to obtain very contrasty line and screen images and sharply defined screen dots, and to reduce the formation of peppers when using somewhat exhausted developing baths.

3,749,575

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Jozef Frans Willems, Wilrijk, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,915
Int. Cl. G03c *5/30, 5/54*
U.S. Cl. 96—66.3 6 Claims

A photographic developing method is described which comprises developing an exposd silver halide emulsion layer of a photographic material with an aqueous alkaline composition in the presence of a hydroxylamine developing agent and a bis(pyridone)azine or salt thereof substituted in the 1-positions by the same or a different alkyl or aralkyl group. The bis(pyridone)azine compound exhibits a super-additive developing effect upon the hydroxylamine or derivative thereof.

3,749,576

PHOTOGRAPHIC LIGHT-SENSITIVE SILVER HALIDE MATERIAL CONTAINING AZO DYES

Bernhard Piller, Marly-le-Petit, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed May 4, 1971, Ser. No. 140,275
Claims priority, application Switzerland, May 5, 1970, 6,689/70
Int. Cl. G03c *1/10*
U.S. Cl. 96—99 8 Claims

Photographic light-sensitive material, especially for the silver dyestuff bleaching process, containing an azo dyestuff derived (a) from a tetrazo compound of a diamine the amino groups of which are bound to benzene radicals which are linked together in amide-like manner by an organic bridge member and (b) 2-phenylamino-8-hydroxy-mono- or -disulphonic acids, the phenyl residues containing at least one further substituent, but being unsubstituted in at least one position ortho to the —NH-group. These magenta dyestuffs are fast to diffusion, easily soluble in water, insensitive to calcium ions and completely bleachable to white.

3,749,577

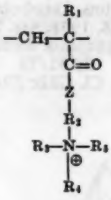
PHOTOGRAPHIC EMULSIONS CONTAINING POLYMERIC PEPTIZER WITH QUATERNARY AMMONIUM GROUPS

Kenneth R. Hollister and Ernest J. Perry, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,807
Int. Cl. G03c *1/04*
U.S. Cl. 96—114 19 Claims

A photographic silver halide emulsion contains a peptizer comprising a polymer having both quaternary ammonium functionality and carboxyl functionality, said polymer consisting essentially of:

(A) At least one polymerized ethylenically unsaturated compound having at least one quaternary ammonium moiety, said polymerized compound being selected from the group consisting of polymerized vinyl imidazolium compounds, polymerized vinyl pyridinium compounds and polymerized vinyl compounds which in the polymeric chain have the structure:



wherein

Z is oxygen or =NH,
R_1 is hydrogen or methyl,
R_2 is a divalent alkylene radical of 1 to 6 carbon atoms,
R_3, R_4 and R_5 are either

(1) independently selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms, or
(2) R_3 and R_4 taken together represent the atoms necessary to complete a 5 or 6 membered heterocyclic ring and R_5 is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms, or
(3) R_3, R_4 and R_5 taken together represent the atoms necessary to complete a 5- or 6-membered heterocyclic ring wherein the nitrogen atom which is attached to R_2 has one double bond attached thereto; and

(B) at least one polymerized ethylenically unsaturated compound having at least one carboxyl radical; such that,

the molar ratio in the polymeric compound of quaternary ammonium functionality to carboxyl functionality is in the range of about 1:1–15.

3,749,578
IMAGE-RECEIVING MATERIAL FOR USE IN SILVER SALT DIFFUSION TRANSFER PHOTOGRAPHY
Kinji Ohkubo and Kazunobu Kato, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
No Drawing. Filed Sept. 7, 1971, Ser. No. 178,391
Claims priority, application Japan, Sept. 7, 1970, 45/78,373
Int. Cl. G03c *5/00*
U.S. Cl. 96—119 5 Claims

An image-receiving material containing a specific amine compound such as bis-(β-hydroxyethyl) amine, tris-(β-hydroxyethyl) amine, or N-β-hydroxyethyl piperidine in at least one of either its receiving layer or an adjacent layer. The amine compound serves to enhance the activity of a development nucleus contained in the receiving layer.

3,749,579
IODINE SOURCE FOR ANIMAL FEEDING IN SALT BLOCK FORM
George F. Andelfinger and Eugene J. Kuhajek, Woodstock, Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.
Original application Aug. 28, 1967, Ser. No. 663,784, now Patent No. 3,526,508, dated Sept. 1, 1970. Divided and this application Dec. 2, 1969, Ser. No. 881,570
Int. Cl. A23k *1/175;* A61k *27/00, 9/00*
U.S. Cl. 99—2 CD 3 Claims

An assimilable source of iodine for the effective supplementation of the diet of animals is provided in the form of a salt block containing a major proportion of sodium chloride and a minor proportion of pentacalcium orthoperiodate. The block is characterized by the resistance of the pentacalcium orthoperiodate to preferential aqueous leaching from the block when exposed to moisture of the elements in the form of rain or snow.

3,749,580
ANIMAL FEED SUPPLY
Jinnosuke Abe, Kango Miyauchi, and Masatoshi Kanoh, Ohhito-machi, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Takata-gun, Shizuoka-ken, Japan
No Drawing. Continuation-in-part of abandoned application Ser. No. 714,019, Mar. 18, 1968. This application Dec. 1, 1970, Ser. No. 94,183
Claims priority, application Japan, Mar. 30, 1967, 42/19,517
Int. Cl. A23k *1/00*
U.S. Cl. 99—9 4 Claims

An animal feed supply, which contains a small amount of the cultured products obtained from a strain of mold fungi belonging to the genus Fusarium and selected from the group consisting of *Fusarium splendens, Fusarium moniliforme, Fusarium oxysporum* and *Fusarium solani.*

3,749,581
PROCESS FOR PRODUCING EDIBLE PROTEIN FIBER
Takashi Sakita, Yokohama, Masaaki Ebisawa, Kawasaki, and Hiroshi Mimoto, Yokohama, Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan
Filed Jan. 29, 1971, Ser. No. 110,977
Claims priority, application Japan, Dec. 10, 1970, 45/108,900
Int. Cl. A23j *1/14, 3/00*
U.S. Cl. 99—14 7 Claims

A process for producing edible protein fibers comprising preparing a spinning solution containing protein as the main ingredient with pH 5.5–11.0 from edible protein materials, continuously extruding the solution in a coagulation bath in form of filaments, characterized in that an additive selected from the group consisting of polyacrylic acid and alkali salts thereof is used in any step of the fiber producing procedures.

3,749,582
CHILLPROOFING FERMENTED MALT BEVERAGES
Irwin M. Stone, Staten Island, N.Y., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
No Drawing. Filed May 3, 1971, Ser. No. 139,946
Int. Cl. C12h *1/02*
U.S. Cl. 99—48 4 Claims

A method of chillproofing fermented malt beverages, to improve storage stability and to prevent the development of hazes and turbidities in the finished packaged beer, comprises the combined use of tannic acid and the growth products of certain mold microorganisms containing decomplexing enzymes for the protein-tannin complex system.

3,749,583
PREPARATION OF A LACTIC SPREAD
Colin John Cox, Welwyn, and John James Hepburn, Harpenden, England, assignors to Lever Brothers Company, New York, N.Y.
No Drawing. Continuation of abandoned application Ser. No. 844,647, July 24, 1969. This application Dec. 6, 1971, Ser. No. 205,426
Claims priority, application Great Britain, July 26, 1968, 35,817/68
Int. Cl. A23c *9/12*
U.S. Cl. 99—59 5 Claims

A lactic spread is prepared by a process using the steps of incubating under microaerophilic conditions with thermobacteria an aqueous dispersion containing 0.5% to 25% protein and 15% to 70% fat, and a dry matter content of 20% to 75%, to obtain a pH of 4.8 to 5.4, pasteurizing the incubated mixture, cooling the pasteurized mixture, and working the cooled mixture to form a cohesive plastic mass.

3,749,584
DECAFFEINATION OF BEVERAGES
Ralph H. Kurtzman, Jr., and Sigmund Schwimmer, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Mar. 28, 1972, Ser. No. 238,923
Int. Cl. A23f *1/10*
U.S. Cl. 99—69 6 Claims

Coffee, tea, and the like are decaffeinated by a procedure wherein caffeine is metabolized by a microorganism, *Penicillium crustosum.*

3,749,585
PROCESS FOR PREPARING CITRUS PUREE
Robert R. Cruse and Bruce J. Lime, Weslaco, Tex., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed May 5, 1971, Ser. No. 140,618
Int. Cl. A23l *1/06, 3/00*
U.S. Cl. 99—100 1 Claim

A process for preparing grapefruit puree from the whole fruit is disclosed. The whole fruit is coarsely cut after blanching, comminuted, then finely comminuted and homogenized to a 0.005 inch particle size, then the bitter principles are removed by enzymatic hydrolysis.

3,749,586
CENTERING METHOD
Lee Jerome Nahm, Jr., St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
No Drawing. Filed Mar. 15, 1971, Ser. No. 124,516
Int. Cl. A23l *1/32*
U.S. Cl. 99—113 8 Claims

A method for substantially surrounding a discrete interior body portion with a coagulable material is disclosed. A predetermined quantity of the coagulable material is placed into a container and the container is

heated for a sufficient period of time to partially coagulate the coagulable material about the inner periphery of the container. The discrete body portion is then inserted into the liquid center of the partially coagulated material and thereafter the container is heated to completely coagulate the coagulable material and substantially center the discrete body therein.

3,749,587

SWEETENED STORAGE STABLE PEANUT BUTTER SPREAD

Fred W. Billerbeck, Lawrence H. Everett, and Craig T. Ritsema, Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,186
Int. Cl. A23l *1/36*
U.S. Cl. 99—128 7 Claims

A peanut-butter sweetening agent composition is provided having at least 5 weight percent based on solids of sweetening agent and a long shelf life substantially free of syneresis.

The composition is prepared by combining at an elevated temperature a mixture of milled peanuts, additional edible oils and a stabilizer with the sweetening agent having a small amount of edible hydrophilic substance. The resulting mixture may then be fed into containers and the containers sealed.

3,749,588

PROTEIN SUPPLEMENTED CLEAR FRUIT JELLIES

John Earl Hunter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,401
Int. Cl. A23l *1/06*
U.S. Cl. 99—132 7 Claims

The addition of acid soluble protein to pectin based jellies to produce nutritionally improved jelly products. Importantly, the characteristic color and clarity of the jelly products are unimpaired by the protein supplementation.

3,749,589

COMPOSITION AND METHOD FOR SELECTIVELY MODIFYING THE PERMEABILITY OF SUBTERRANEAN FORMATIONS

Derry D. Sparlin and Mack W. Hunt, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed June 1, 1971, Ser. No. 148,914
Int. Cl. C08h *15/02*; C09k *3/00*
U.S. Cl. 106—123 15 Claims

A composition comprising metal alkoxides and metal dispersions in organic dispersing agents, optionally diluted with organic solvents, for use in modifying the permeability of subterranean formations and a method for selectively modifying the permeability of subterranean formations.

3,749,590

AMINE TREATMENT OF SULFONATED PHTHALOCYANINES

Daniel Walter Thomas, Bridgewater, and Vito Albert Giambalvo, Middlesex, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,965
Int. Cl. C08h *17/14*
U.S. Cl. 106—288 Q 12 Claims

A copper phthalocyanine pigment which is useful in a wide variety of vehicle formulations is prepared by treating a partially sulfonated copper phthalocyanine, which may contain red or green shade unsulfonated copper phthalocyanine together with the sulfonated copper phthalocyanine, with a primary, secondary or tertiary alkyl amine having a total of from about 4 to about 12 carbon atoms in the alkyl group or groups in an aqueous medium at a temperature between about 20° C. and about 100° C.

3,749,591

METHOD FOR FORMING A POLYSILOXANE IMPREGNATED POROUS SHEET AND ARTICLE THEREOF

Shibley A. Hider and Walter Kitaj, Toledo, and Robert E. Martin, Lakewood, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation-in-part of application Ser. No. 834,606, June 10, 1969, now Patent No. 3,628,985, which is a continuation of abandoned application Ser. No. 503,760, Oct. 23, 1965. This application Dec. 11, 1970, Ser. No. 97,304
Int. Cl. B44d *1/094*; C03c *25/02*
U.S. Cl. 117—21 24 Claims

A porous sheet is formed by first impregnating a fibrous web with about 2% to 99.75% of an organopolysiloxane and thereafter pressing said web and fully curing said siloxane to form a substantially nonporous sheet. Thereafter, the impregnated sheet is heated to the point at which at least a portion of the organic constituents present in the sheet, and especially in the siloxane, volatilize to leave a porous structure exhibiting good structural strength and other desirable physical properties.

3,749,592

RADIATION CURING LACQUERS

Joseph E. Gaske, Mount Prospect, and Robert E. Ansel, Hoffmann Estates, Ill., assignors to De Soto, Inc., Des Plaines, Ill

No Drawing. Filed Mar. 25, 1971, Ser. No. 128,185
Int. Cl. B44d *1/50*
U.S. Cl. 117—62 13 Claims

A substrate is coated with a lacquer in which a normally solid radiation curable resin system is dissolved in an organic solvent. After the solvent has evaporated, the deposited film is physically worked and then irradiated to increase the solvent resistance and physical toughness of the film.

3,749,593

LAMINATED MATERIALS AND METHOD OF PREPARATION

Le Roy H. Keiser, Downers Grove, Ill., assignor to Phillips Petroleum Company

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,689
Int. Cl. B32b *7/06*; B44d *1/14*
U.S. Cl. 117—68 30 Claims

A laminate material is produced by coating a substrate with a first silicone release agent coating containing a curing catalyst, a curing accelerator and/or an adhesion promoter and subsequently overcoating said first silicone release coating with a second silicone release agent coating containing a curing catalyst but no cure accelerator or adhesion promoter. The laminates are particularly useful as release sheets.

3,749,594

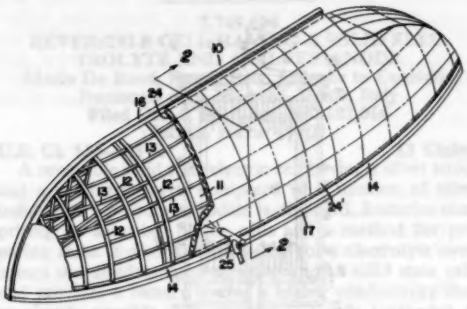
METHOD OF CONSTRUCTING REINFORCED ARTICLES HAVING A PLASTIC CORE, AND FRAME THEREFOR

Everett I. Bibb, 24225 San Pedro Lane, Carmel, Calif. 92921

Filed Dec. 2, 1970, Ser. No. 94,398
Int. Cl. B05b *7/00*; B32b *3/26*
U.S. Cl. 117—104 A 4 Claims

A method is described of constructing boats or the like, in which a reinforced core is used, consisting of a skeleton frame or lattice embedded in a thermosetting plastic or resin. The plastic is sprayed against one side of the frame, while a flexible impervious member is maintained against the opposite side of the frame, so that when said member is removed, the surface of that side of the core from

which said member is removed, requires little or no finishing. The frame consists of intersecting tubular members, which are joined together at their points of intersection in a novel manner.



3,749,595
METHOD FOR MAKING ANHYDROUS CHROMIUM SESQUIOXIDE BY REDUCING A HEXAVALENT CHROMIUM COMPOUND
Jean Foucry and Alain Auriol, Tarbes, France, assignors to Ceraver, Paris, France
No Drawing. Filed May 4, 1971, Ser. No. 140,274
Claims priority, application France, May 6, 1970, 16,592
Int. Cl. B44d 5/12; C01g 37/02
U.S. Cl. 117—119.6 10 Claims

A method of making anhydrous chromium sesquioxide by reducing a hexavalent chromium compound not decomposable at a temperature of less than 300° C., comprising subjecting said hexavalent chromium compound to heating in a non-reducing atmosphere between about 197 and 280° C., then heating in a reducing atmosphere between about 250 and 350° C.

3,749,596
METHOD FOR SEALING ANODIZED ALUMINUM
Chozo Yoshimura, Nara, Japan, assignor to Okuno Chemical Industry Company Limited, Higashi-ku, Osaka-shi, Japan
No Drawing. Filed May 11, 1971, Ser. No. 142,416
Claims priority, application Japan, May 13, 1970, 45/41,183
Int. Cl. C23f 7/06
U.S. Cl. 117—127 1 Claim

A composition for sealing aluminum oxide coating anodically formed on aluminum and aluminum base alloys comprises an aqueous solution containing at least one g./liter of oxygen acid ion of phosphorus and at least 0.2 g./liter of alkaline earth metal ion and having a pH of 2.5 to 9.0, and a method for sealing the aluminum oxide coating comprises contacting the coating with said composition at 20 to 50° C. and drying the resultant coating.

3,749,597
TEXTILE FINISHING COMPOSITIONS
Earl H. Hartgrove, Jr., Parsippany, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.
No Drawing. Original application Aug. 16, 1968, Ser. No. 753,079, now Patent No. 3,595,813. Divided and this application Mar. 8, 1971, Ser. No. 122,248
Int. Cl. B44d 1/22
U.S. Cl. 117—138.8 F 5 Claims

A method of imparting durable antistatic finish to hydrophobic materials normally susceptible to accumulating electrostatic charges comprising treating said materials in an acid environment with a hydroxy terminated polyfunctional polyoxyalkylene compound and an acid-catalyzed nitrogen-containing crosslinking agent.

3,749,598
SURFACE TREATED STEEL FOR THE USE OF FORMING OPERATION
Kosei Kushima and Kanji Yahano, Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
No Drawing. Filed Apr. 29, 1971, Ser. No. 138,761
Claims priority, application Japan, July 30, 1970, 45/66,763
Int. Cl. B21b 45/02
U.S. Cl. 117—134 4 Claims

Surface treated steel sheet for use in a forming operation having a coating layer of a composition, which is solid at ambient temperature, comprising 95–60 weight percent of a lubricant component consisting of 90–60 mol percent of a higher fatty acid and 10–40 mol percent of an amine, and 5–40 weight percent of a coupling agent, on the surface of the steel sheet.

3,749,599
PROCESS FOR TREATING SYNTHETIC FIBER WITH A FIRE RETARDANT AND THE TREATED FIBER
Sylvester Bergman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 13, 1971, Ser. No. 180,198
Int. Cl. C09d 5/18
U.S. Cl. 117—136 8 Claims

Polyester, cellulose triacetate, and polyamide fibers are made fire retardant by contacting with a hot glycol solution of 2-(2,4,6-tribromophenoxy) ethanol. This compound also acts as a dye assistant for polyester and cellulose triacetate fibers. The treated fibers are resistant to loss of the brominated compound during laundering and dry cleaning processes.

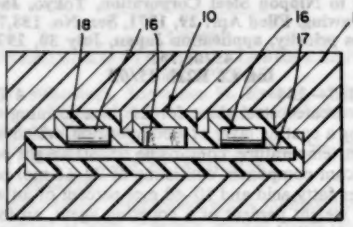
3,749,600
FIRE-RETARDANT AND DYE-RECEPTIVE SYNTHETIC FIBERS
Sylvester Bergman and Richard Garth Pews, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed July 26, 1971, Ser. No. 166,249
Int. Cl. C09d 5/18
U.S. Cl. 117—136 10 Claims

Polyester and cellulose triacetate fibers are made dye-receptive and resistant to burning by impregnating the fibers with an organic solvent solution of any of certain polybrominated phenol derivatives. The impregnated fibers are resistant to loss of the brominated compound during laundering or dry cleaning.

3,749,601
ENCAPSULATED PACKAGED ELECTRONIC ASSEMBLY
Harry D. Tittle, Cypress, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Apr. 1, 1971, Ser. No. 130,125
Int. Cl. H01l 1/10
U.S. Cl. 117—218 5 Claims

An improvement in the economy of packaging by locking out harmful particulates before application of insulation packing and savings in rework or repair of insulation packaged and encapsulated electrical components, assemblies or circuitry. The three component package structure provided is prefabricated electronic circuitry components structure having a conformal coating of relatively solvent insoluble polymers as polymers of para-xylylene material or relatively solvent insoluble polymers of polyphenylene and curing agent intermediate the electronic components and a conventionally applied relatively solvent soluble coating of insulating resin material or conventional foam as polyurethane, epoxy resin, and the like potting material applied thereover. In addition to improving upon the insulation encapsulated pre-

fabricated electronic circuitry by reducing the number of defective electronic units manufactured, this improved packaging also is of economic value to the industry by enabling economic chemical removal of the insulating foam or potting compound and reworking the circuitry or replacement of a defective circuitry component.



Further, the multiple coatings provide more assurance of maintaining resonate frequency and aids in improving vibration and shock resistance.

3,749,602

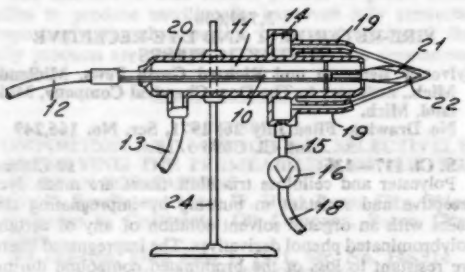
METHOD OF REMOVING HIGH-TEMPERATURE ENAMEL INSULATION FROM ELECTRICALLY CONDUCTIVE WIRE

Richard C. Mosier, Grabill, Ind., assignor to General Electric Company

Original application Nov. 25, 1970, Ser. No. 92,561, now abandoned. Divided and this application May 24, 1972, Ser. No. 256,600

Int. Cl. B08b 7/00; B21f 21/00

U.S. Cl. 134—19 9 Claims



A method of removing high-temperature enamel insulation such as esterimide and polyimide from electrically conductive wire. The method comprises the steps of heating the high-temperature enamel insulation to be removed to red heat as by use of a gas-oxygen torch whereupon the heated insulation is degraded to a weakly cohesive state. A stream of coolant such as a mixture of air and water is then directed at the heated insulation to cool and blow the heated insulation from the wire.

3,749,603

ALKALI METAL/SULFUR BATTERY HAVING A CATHODIC CURRENT COLLECTOR COATED WITH MOLYBDENUM DISULFIDE

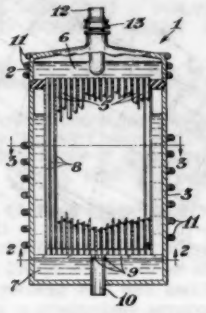
Robert R. Stringham, Concord, and William H. Taplin III, Lafayette, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 17, 1972, Ser. No. 244,410

Int. Cl. H01m 35/02

U.S. Cl. 136—6 7 Claims

Disclosed is an alkali metal/sulfur battery having as a cathodic current collector a shaped member comprising a substrate to which is adhered a 50 A. to 5000 A. thick coating of molybdenum disulfide. The substrate can be an outer layer or may constitute the entire member and consists essentially of aluminum, magnesium or various alloys containing at least minor amounts of these metals. The



electrical resistance of the coated cathode generally drops to a minimum upon being contacted with a molten alkali metal polysulfide for a relatively brief period of time.

3,749,604

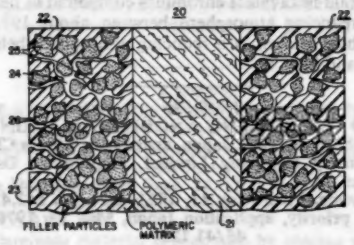
HEAT RESISTANT SUBSTRATES AND BATTERY SEPARATORS MADE THEREFROM

Alois Langer, Pittsburgh, Luciano C. Scala, Murrysville, and Charles R. Ruffing, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1970, Ser. No. 19,009

Int. Cl. H01m 3/02

U.S. Cl. 136—20 5 Claims



A flexible substrate having a caustic resistant support and at least one membrane comprising a solid polymeric matrix containing a network of interconnected pores and interdispersed inorganic filler particles with a ratio of filler: polymer in the polymeric matrix of between about 1:1 to 5:1, is made by coating at least one side of the support with a filler:coating formulation mixture of inorganic filler particles and a caustic resistant, water insoluble polymer dissolved in an organic solvent, and removing the solvent from the mixture to provide a porous network within the polymeric matrix.

3,749,605

BATTERY HAVING ZINC ELECTRODE CONTAINING TiO_2

Randall W. Peters, Madison, Wis., assignor to ESB Incorporated

No Drawing. Filed Nov. 3, 1971, Ser. No. 195,460

Int. Cl. H01m 43/02

U.S. Cl. 136—30 1 Claim

TiO_2 when included in zinc electrodes has been found to give improved shelf life in alkaline batteries designed

to have high discharge rate capability. Negative electrodes containing the zinc and TiO_2 may be prepared in different manners. The invention is useful in primary alkaline systems such as silver-zinc and mercury-zinc.

3,749,606

REVERSIBLE CELL HAVING A SOLID ELECTROLYTE AND A SILVER ANODE

Mario De Rossi, Rome, Italy, assignor to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Oct. 6, 1971, Ser. No. 187,066
Int. Cl. H01m *11/00*
U.S. Cl. 136—83 R 13 Claims

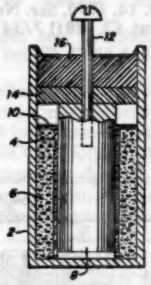
A reversible solid state electric cell having a silver anode and a solid electrolyte composed of a mixture of silver iodide and a polyamine iodide is disclosed. Batteries comprising an assembly of the cells and a method for preparing same is also disclosed. The solid electrolyte overcomes the disadvantages of prior known solid state cells and provides a battery having a higher conductivity than previously possible. The positive electrode (cathode) of the cell is made of a mixture of a powdered conductive material, such as graphite, a polyamine iodide and molecular iodine.

3,749,607

LITHIUM BATTERIES HAVING A CATHODE COMPOSITION COMPRISING A MIXTURE OF NICKEL SULFIDE AND ALUMINUM

Raymond J. Jasinski, Boston, and Lewis H. Gaines, Framingham, Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.

Filed Aug. 25, 1969, Ser. No. 852,557
Int. Cl. H01m *17/00*
U.S. Cl. 136—83 R 13 Claims



A battery comprising a lithium anode, a cathode comprising nickel sulfide and aluminum fibers, and an electrolyte made up of an ionizable inorganic salt dissolved in an aprotic organic solvent.

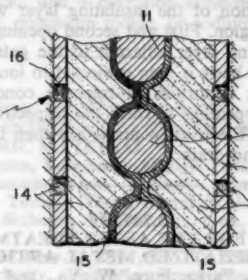
3,749,608

PRIMARY ELECTROCHEMICAL ENERGY CELL

Robert I. Sarbacher, Arcadia, Calif., assignor to John C. Bogue, Santa Monica, Calif.

Filed Nov. 24, 1969, Ser. No. 879,429
Int. Cl. H01m *17/02*
U.S. Cl. 136—83 R 10 Claims

A high energy and current capacity reserve primary electrochemical cell uses a specially coated base element for the cathode electrode. The coating is the product of sintering nickelous ammonium sulfate on the surface of the base element, and in the complete cathode system this coating is interposed between the base element and an electrochemically active cathodic material. The maximum current and energy capacity of the cell per unit weight and volume is also enhanced by using foraminous electrodes to increase the available surface area per unit volume and by designing the associated cell structure to maximize



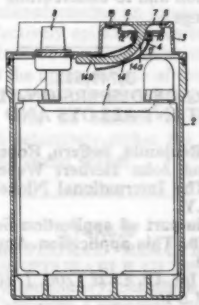
the effect of the increased surface areas of the foraminous electrodes.

3,749,609

SECONDARY BATTERIES

Harold Morton, Manchester, England, assignor to Oldham International Limited, Denton, Manchester, England

Filed Jan. 12, 1972, Ser. No. 217,365
Claims priority, application Great Britain, Jan. 13, 1971, 1,676/71
Int. Cl. H01m *1/02, 7/00*
U.S. Cl. 136—170 9 Claims



The cells of a secondary battery are each provided with a filler opening which communicates with a filling channel extending longitudinally of the lid of the battery. Resiliently deformable tubes, one for each cell, have their outer ends associated with the filler openings and their inner ends extending into the headspace of the battery. A cover for the filling channel is displaceable relatively to the channel and is provided with tube-deforming members, one for each tube, which in the channel-closing position of the cover so deform the tubes that the inner ends of the tubes are located above the level of and are directed away from electrolyte contained in the cells.

3,749,610

PRODUCTION OF SILICON INSULATED GATE AND ION IMPLANTED FIELD EFFECT TRANSISTOR

Richard C. G. Swann, North Palm Beach, and Jack I. Penton, West Palm Beach, Fla., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 11, 1971, Ser. No. 105,291
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 10 Claims

This is a method of manufacturing a metal insulator semiconductor field effect transistor having a source, drain

and channel region, and a gate formed over the channel region. The field insulator is first formed on a semiconductor substrate, which substrate is of one conductivity type. A polycrystalline silicon layer is selectively formed over that portion of the insulating layer which overlies the channel region. First and second openings are formed in the insulating layer adjacent to the gate region. The semiconductor body is then subjected to ion implantation of the doping impurities of opposite conductivity type through said openings to form the respective source and drain regions. Electrical contacts are then formed to the source, gate and drain.

3,749,611

PROCESS FOR THE AFTER-TREATMENT OF PHOSPHATIZED METAL ARTICLES

Edward Leon, Parkersburg, W. Va., and Malcolm H. Shatz, Williamsville, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,257
Int. Cl. C23f 7/08
U.S. Cl. 148—6.15 R **24 Claims**

A process for the after-treatment of phosphatized metal articles, which process comprises treating the phosphatized surface of the metal articles with a non-aqueous solution containing a novolac phenol-formaldehyde resin having a molecular weight of from about 300 to about 5,000, and thereafter baking the treated article at a temperature of at least about 190° C. in the presence of an oxygen-containing atmosphere.

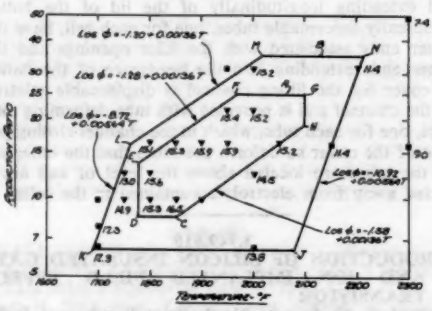
The articles so treated are rendered exceptionally resistant to corrosion and to undercutting when coated with final finish coatings.

3,749,612

HOT WORKING OF DISPERSION-STRENGTHENED HEAT RESISTANT ALLOYS AND THE PRODUCT THEREOF

John Stanwood Benjamin, Suffern, Robert Lacock Cairns, Sloatsburg, and John Herbert Weber, Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 52,378, July 6, 1970. This application Apr. 6, 1971, Ser. No. 131,761
Int. Cl. C22f 1/00, 1/10
U.S. Cl. 148—11.5 F **13 Claims**



A method is provided for producing a hot worked dispersion-strengthened heat resistant alloy composition characterized by a metallographic structure consisting essentially of large coarse grains having a preferred orientation relative to a major axis of working, the method comprising providing a confined batch of cold worked mechanically alloyed composite particles comprised of alloying constituents which when alloyed together provide a dispersion-strengthened alloy, which is preferably also age hardenable, and then hot working (e.g., extruding) said batch under correlated conditions of temperature, reduction ratio and strain rate such that when the resulting hot worked product is subsequently heated to an elevated germinative grain growth temperature, coarse grains are formed disposed in one or more working directions of the alloy.

3,749,613

SURFACE PREPARATION OF TITANIUM AND TITANIUM ALLOYS FOR BONDING MATERIALS THERETO

Lewis Edwin Augustine, Santa Monica, Calif., assignor to Titanium Processors Incorporated

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,032
Int. Cl. C23f 7/26
U.S. Cl. 148—6.21 **10 Claims**

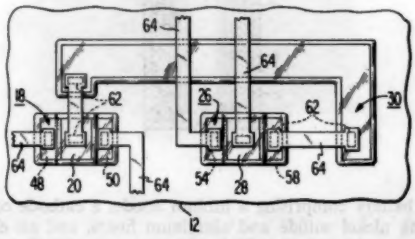
A method for preparing a titanium or titanium alloy substrate for acceptance of a coating of metal or other material thereon whereby the substrate is treated with a bath containing chromic acid and sulfuric acid. Coatings applied after pretreatment are strongly adherent to the substrate and resist cracking, chipping or stress migration. A nickel strike is optional as further pretreatment prior to metallic coating. A chromic acid-sulfuric acid bath is used in said method.

3,749,614

FABRICATION OF SEMICONDUCTOR DEVICES

Edward Joseph Boleky III, Cranbury, and Joseph Hurlong Scott, Jr., Princeton, N.J., assignors to RCA Corporation

Filed Sept. 14, 1970, Ser. No. 71,840
Int. Cl. H01l 7/34
U.S. Cl. 148—188 **5 Claims**



Spaced first islands of semiconductor material, from which complementary field effect transistors are to be made, are formed on a substrate. Pedestals, comprising an insulating layer covered by a doped layer of silicon, are provided on each of the islands defining the channel regions of the transistors to be formed. Second islands, formed of doped silicon, are also provided on the substrate, the second islands serving as connectors for the device. A solid-to-solid diffusion source layer is provided on each of the first islands, and the impurities therein are diffused into the first islands to form the source and drain regions of the transistors. In one embodiment, some of the doped layers of the pedestals are further doped during the diffusion step, whereas others of the doped layers are masked from the diffusion source. In another embodiment, all the doped layers are masked from the

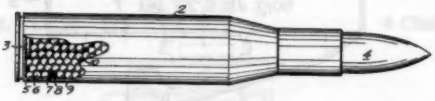
diffusion source. Prior to the performance of the diffusion step, a thermally grown oxide layer is provided on the second islands.

3,749,615

GUN AMMUNITION COMPOSED OF ENCAPSULATED MONOPROPELLANTS

Edward G. Dorsey, Jr., John A. Peterson, and Robert K. Lund, Brigham City, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed June 11, 1971, Ser. No. 152,205
Int. Cl. C06d 5/08, 5/10
U.S. Cl. 149—6 11 Claims



Microcapsules of liquid monopropellants provide propellant charges for gun ammunition. A capsule wall material may be chosen that will contribute to the energy of the charge; and high loading density of propellant may be achieved by the use of capsules having carefully selected bimodal sizes.

3,749,616

SOLID POLYURETHANE PROPELLANT AND METHOD OF MAKING THE SAME

Herman F. Krackenberger and Daniel J. Smith, Elkton, Md., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed July 7, 1960, Ser. No. 41,428
Int. Cl. C06d 5/06
U.S. Cl. 149—19 10 Claims

4. A solid propellant consisting essentially of a solid inorganic oxidizer and a polyurethane fuel binder, said fuel binder being a cured isocyanate-terminated polyester which is a reaction product of a polyisocyanate and a polyester having an acid component derived from a mixed acid, said mixed acid being a mixture of the dimer and trimer of an unsaturated C_{18} fatty acid.

3,749,617

METHOD OF BONDING SILICONE RUBBERS TO ORGANIC RUBBERS AND COMPOSITE OBJECT

Roger Fountain, St. Louis, and Gregory M. McLaughlin, Bel Ridge, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

No Drawing. Filed July 6, 1971, Ser. No. 160,101
Int. Cl. B32b 25/20
U.S. Cl. 156—3 7 Claims

A process is disclosed whereby silicone rubbers can be bonded to organic rubbers by treating the organic rubber surface with hydrogen peroxide.

3,749,618

PROCESS AND SOLUTION FOR REMOVING TITANIUM AND REFRACTORY METALS AND THEIR ALLOYS FROM TOOLS

Eugene R. Fannin and John Gumbelevicius, St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 803,118, Feb. 27, 1969. This application Sept. 20, 1971, Ser. No. 182,209
Int. Cl. C23g 1/06, 1/04
U.S. Cl. 156—3 8 Claims

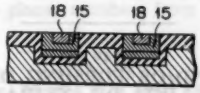
Titanium and refractory metals and their alloys are removed from tools, usually made from steel or carbides, without deleterious effects on the tool by immersing the coated tool in an acidic solution including fluoride ions, water, a source of COOH radical, such as formic, oxalic, or tartaric acid, and a corrosion inhibitor, such as triethanolamine, potassium iodide, or sodium nitrite.

3,749,619

METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT ISOLATED BY DIELECTRIC MATERIAL

Hisashi Muraoka, Yokohama, Hiroshi Tsutsumi and Taizo Ohashi, Kanagawa-ken, Yasusuke Sumitomo, Yokohama, and Toshiko Yasui, Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 21, 1971, Ser. No. 155,193
Claims priority, application Japan, June 25, 1970, 45/54,751
Int. Cl. H01l 7/50
U.S. Cl. 156—17 12 Claims



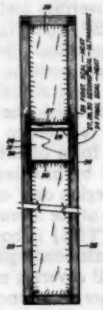
A method for manufacturing an integrated circuit comprises steps of selectively epitaxial-growing island regions on the upper surface of a silicon substrate, covering said island regions and the upper surface of the substrate, forming a silicon layer on said insulating film and etching the silicon substrate with an etchant of HF, HNO_3 and CH_3COOH which selectively etches the silicon substrate without etching the island region.

3,749,620

PACKAGE FOR PLURAL REACTABLE COMPONENTS WITH RUPTURABLE ULTRASONIC SEAL

William Herbert Montgomery, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 20, 1969, Ser. No. 878,423
Int. Cl. B32b 31/20
U.S. Cl. 156—73 4 Claims



A package for a two component system which requires separate, secure storage with rupture of an in-

ternal seal to permit mixing of components at the time of use is provided by having at least one and preferably three, ultrasonic seals dividing a laminate film package into compartments, with a perimeter heat seal around the edges of the package, and which seals the ends of the the ultrasonic seals after formation. The space between the ultrasonic seals is a security compartment, and may contain a dye to indicate leakage into the compartment. The compartments contain components for resins, pharmaceuticals, or chemiluminescent systems, or the generation of heat, generation of cold, or photographic processing solutions. Ultrasonic sealing permits a reliable chemical proof seal of predictable and controllable rupture characteristics. The two compartments contain storage stable components, which react on mixing.

The compartments can be generated continuously from continuous strip material in rolls, with edge and barrier seals being continuously formed, and filling nozzles extending into the tubes formed by the sealing. By severing and sealing, a series of double filled compartment packages are continuously formed.

3,749,621

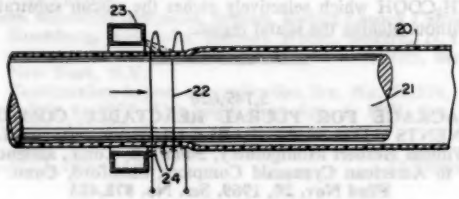
SECURING AND/OR FORMING OF COVERINGS AND THE LIKE OF TETRAFLUORINATED ETHYLENE AND FLUORINATED ETHYLENE POLYMERS

James P. Shoffner, Wilmington, Del., assignors to Fluorodynamics, Inc., Newark, Del.

Continuation-in-part of application Ser. No. 647,477, June 20, 1967. This application June 9, 1971, Ser. No. 151,299

Int. Cl. B29c *27/04*; C09j *7/00*

U.S. Cl. 156—86 10 Claims



The invention is directed to the concept of securing and/or forming of coverings and the like, of fluorinated ethylene polymer (FEP) materials, which makes advantageous use of the dimensional change occurring when the material, or controlled portions thereof, are heated to melting temperatures. Typically, the invention is most useful in applications in which the thickness of the cover material is small in relation to the dimensions of the covered part. In one form of the invention, bonded roll coverings are formed by bringing to fusion temperature the bonding surface region only of a heat-shrinkable FEP tube. In another form of the invention, a covering of tetrafluorinated ethylene (TFE) is bonded to a process roller by using an intermediate bonding film of fluorinated ethylene polymer. The TFE covering maintains the FEP bonding layer under pressure, in a concentration of heat energy at the interface of the FEP layer of the metal process roller and serves to melt the FEP and effect a bond thereof to the TFE and to the roller surface. The invention utilizes a concentration of heat energy at the interface of an FEP cover-element, combined with a thermally derived or enhanced interface pressure, to achieve the desired effect.

3,749,622

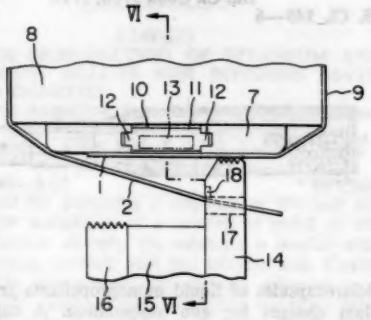
METHOD OF WELDING THERMOPLASTIC BAND FOR USE IN PACKING MACHINE AS WELL AS APPARATUS RELEVANT THERETO

Yoshimasa Sato, Yokohama, and Syozo Togashi, Kawasaki, Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1971, Ser. No. 196,413

Int. Cl. B31f *5/00*; B65h *19/00, 69/02*

U.S. Cl. 156—157 3 Claims



A method of welding applicable to a packing machine for use in strapping the package with a thermoplastic band, which employs an apparatus comprising: a slide plate supporting the overlap portions of the plastic band to be welded; a heat plate which is disposed parallel to the direction of strain of the strapping band and is devised to melt the overlap portions of the plastic band after its advance with the retreat of said slide plate; and a press bar which supports said plastic band at the time of melting and presses the melted overlap portions of said plastic band against the slide plate after the retreat of the heat plate to thereby weld them together.

3,749,623

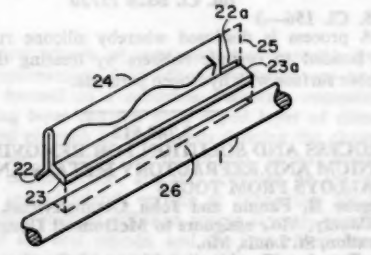
METHOD OF MAKING ARCHERY ARROW

Alfred E. Benoit, 221 Whitney St., Northboro, Mass. 01532

Continuation of application Ser. No. 724,430, Apr. 26, 1968, now Patent No. 3,595,579. This application Apr. 5, 1971, Ser. No. 131,377

Int. Cl. B65h *81/00*

U.S. Cl. 156—187 3 Claims



Plastic archery arrow fletching which is flexible to ordinary mechanical and aerodynamic forces and sufficiently resilient so that after flexing it returns rapidly to its

original shape is made by cutting two sections from a sheet of plastic, folding each section along corresponding edges to define a vane portion and a flap portion on each and attaching the vane portions back to back to form a single vane with flaps extending in opposite directions from one edge thereof, whereby the vane is attachable to the shaft of an arrow by the flap portions.

3,749,624

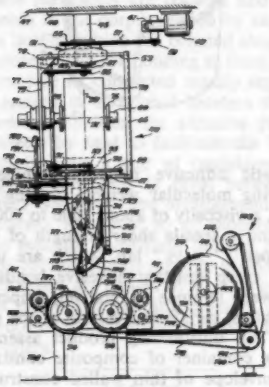
METHOD OF MAKING A BIAS LAID RIBBON

Charles A. Lee and Warren R. Furbeck, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Original application Apr. 9, 1968, Ser. No. 719,986, now Patent No. 3,580,784. Divided and this application Mar. 19, 1971, Ser. No. 126,087

Int. Cl. B31c *3/00*

U.S. Cl. 156—195 **4 Claims**



A multi-ply ribbon is formed by a method in which at least one web of material is wound spirally about a mandrel and then stripped and flattened. To reduce inertia and gyroscopic forces encountered when unwinding a web parent roll about its longitudinal axis while it is spinning relative the mandrel about another axis, the parent roll is mounted in a rotatable carrier at one end of the mandrel with the respective axes being substantially coplanar. The mandrel may be suspended from the carrier and driven in a direction reverse to that of the carrier so that the mandrel remains stationary relative to nip rolls. The preferred ribbon is formed of bias laid, superimposed plies of creped tissue and has the surfaces of the ribbon textured by spaced depressions at which fibers in one ply are interlocked with fibers in an adjacent ply.

3,749,625

MACHINING PROCESS

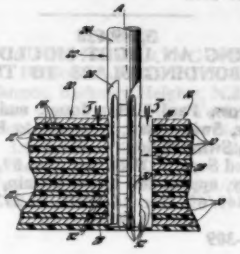
Roger M. Berg, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1971, Ser. No. 171,149

Int. Cl. B23c *1/00*; B32b *31/00*

U.S. Cl. 156—250 **4 Claims**

A plurality of substantially planar members and a plurality of generally planar spacers are laminated to each other in an alternating relationship by a thermoplastic bonding agent. A rotatable milling cutter with a plurality of axially spaced and axially extending cutting edges along the rotational axis is positioned with this axis normal to the planar members. The cutting edges are out of square relative to a plane normal to the rotational axis and are respectively aligned with the planar members. The milling cutter is rotated and moved relative to the planar members to respectively engage the cutting edges with the planar members and simultaneously machine the edges



of the planar members out of square. The laminated spacers and machined planar members are heated to allow separation of the planar members from the spacers and from each other.

3,749,626

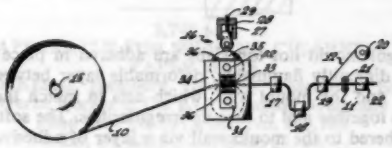
ROTARY DIE APPARATUS AND PROCESS FOR MANUFACTURING LABELS OR THE LIKE

Homer G. Buck, 803 S. Rimpau Ave., Los Angeles, Calif. 90005

Filed June 28, 1971, Ser. No. 157,108

Int. Cl. B32b *31/00*

U.S. Cl. 156—251 **6 Claims**



In a label making machine, at a die cutting station, the cutting edge of a rotary die is maintained in precisely spaced relationship to an opposing anvil roll by the essentially incompressible nature of a web of the backing paper and label paper nipped between these two rotary elements, whereby the cutting edge pierces only the label paper and adhesive layer of the composite sheet structure, without piercing the backing sheet.

3,749,627

RESERVOIR NAPKIN MANUFACTURING PROCESS

John Leslie Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif. 91105

Original application July 5, 1968, Ser. No. 742,922. Divided and this application Mar. 29, 1971, Ser. No. 129,151

Int. Cl. B32b *31/00*; A61f *13/16*

U.S. Cl. 156—268 **1 Claim**

This invention teaches a new menstrual napkin embodying multiple ply tissue paper sheets lying coplanarly adjacent and forming an absorptive section. The absorptive section has a multiple, spaced pattern of coaxially concentric openings, in at least an appreciable fraction of the multiple plies of tissue paper, forming reservoir

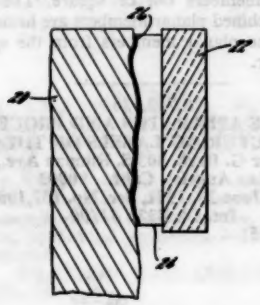
for the menstrual fluid volume prior to absorption of the fluid by the tissue paper. A pair of mounting and securing openings are provided, one at each opposed end of the napkin which pierces all layers of the napkin and is suitable for adaptively securing the napkin to a sanitary napkin support belt.

3,749,628

HOT TOPPING AN INGOT MOULD BY ADHESIVELY BONDING SLABS TO THE MOULD WALL

John Nancarrow, Paul Victor Jones, and Peter Stanley Clark, Chur, Switzerland, assignors to Foseco Trading A.G., Chur, Switzerland

Filed Sept. 3, 1970, Ser. No. 69,462
Claims priority, application Great Britain, Oct. 16, 1969, 50,849/69; Dec. 16, 1969, 61,272/69
Int. Cl. B22d 7/10
U.S. Cl. 156—309 15 Claims



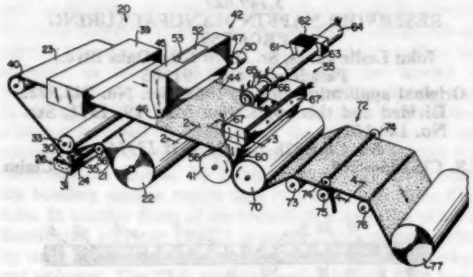
Ingot mould hot top slabs are adhered in place via a soft, difficultly flammable, deformable layer between the slabs and the mould wall, which acts to match the contours together and to take up irregularities. The soft layer is adhered to the mould wall via a layer of adhesive.

3,749,629

METHOD OF MAKING A DECORATIVE LAMINATION

William P. Andrews, Richmond, and Jack L. Beuth, Chesterfield, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 12, 1971, Ser. No. 123,740
Int. Cl. B32b 31/30
U.S. Cl. 156—276 16 Claims



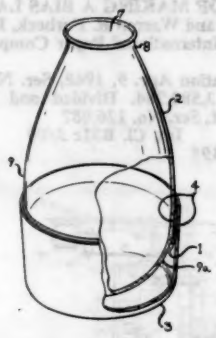
This disclosure relates to an apparatus for and method of making a decorative lamination in a continuous process wherein particles of decorative material are surrounded by a liquid plastic film which is then solidified around such particles to provide a solid transparent sheet-like matrix having the particles embedded therewithin so that they are readily visible.

3,749,630

PROCESS FOR BONDING A GLASS CONTAINER TO A CUP-SHAPED FITMENT WITH HOT MELT ADHESIVE

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed June 25, 1971, Ser. No. 156,693
Int. Cl. B32b 31/26
U.S. Cl. 156—293 15 Claims



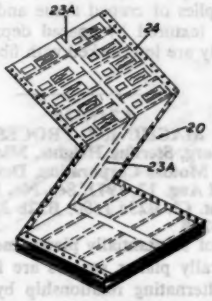
Thermoplastic adhesive polycarbonamide-ester compositions having molecular weights ranging from about 2000 to 7000, a viscosity of about 2000 to 5000 centipoise at 160° C. and a tensile shear strength of about 75 to 140 pounds per 1" x ½" lap, which are useful in the formation of creep resistant adhesive bonds in product assembly between laminae of relatively impervious materials such as glass, metals and certain of the plastics, e.g., polyethylene. An outstanding product assembly of this invention is a container of composite construction having a glass envelope of thin walled construction in the shape of an inverted light bulb bonded to a plastic cup-like base member with the above-described thermoplastic adhesive composition.

3,749,631

METHOD AND APPARATUS FOR PREPARING AND ASSEMBLING COMMUNICATIONS FOR MASS DISTRIBUTION

John M. Batchelder, New Shrewsbury, N.J., and Augustus W. Griswold, Rochester, N.Y., assignors to Dapak Systems, Inc., New York, N.Y.

Filed Apr. 26, 1971, Ser. No. 137,502
Int. Cl. B32b 31/00
U.S. Cl. 156—350 13 Claims



This disclosure is directed to a method and apparatus for assembling informational material or data for mass distribution from continuous sheets of web material. This is attained by forming a laminate of compatible sheets

from two or more continuous strips of web material to define the informational unit readied for mailing or distribution. The continuous strips depending on the article formed, are pattern printed with suitable adhesive and perforated in a predetermined manner to define compatible continuous sheets. The respective compatible sheets are then imprinted with the desired information or data, be it variable or uniform, prior to the lamination or bonding of the compatible sheets. After printing the respective sheets are subsequently collated and bonded together in accordance with the pressure sensitive pattern printed thereon. The continuous webs thus bonded are then severed or cut into individual informational units to be distributed in accordance with the perforated pattern.

An apparatus for effecting high speed collation and bonding of the compatible sheets of continuous webs comprises a machine having an input section and an output section. The respective sheets of continuous web material are simultaneously fed into the input section of the machine where the sheets are collated and conveyed at very high speeds to the output section by an endless conveyor. In the output section the collated sheets are passed between pressure rollers for bonding to form a continuous laminated structure of connected readily separable units.

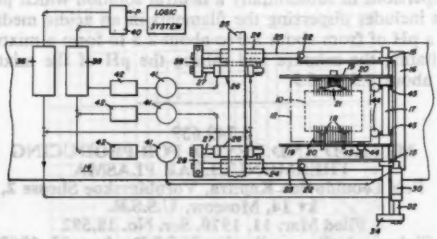
A heater section is interposed between the input and output section to condition the adhesive pattern of the compatible sheets by heat to facilitate the bonding. The heater section includes a pair of complementary heater platens, hingedly connected to pivot between operative and inoperative positions. The arrangement is such that the heater platens will pivot to an inoperative position whenever the machine is stopped for any reason. Upon passage of the collated sheets through the pressure rollers the laminated sheets are cooled by passing over a cooling medium, and secondary bonding pressure is applied by passing the cooled laminated sheets through a second set of pressure rollers.

3,749,632

MATERIAL EDGE DETECTING APPARATUS

Carl B. Gibbons, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,835
Int. Cl. B32b *31/12;* B31b *1/02*
U.S. Cl. 156—364 **15 Claims**



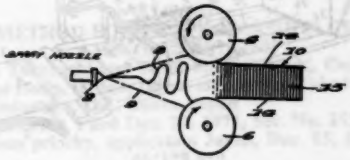
A material edge detecting apparatus for electrically detecting the edge of a material such as a sheet by sensing the change in electrical resistivity between a sheet support and the sheet edge and in response thereto generating a signal. In one application, the detecting apparatus is embodied in an aligning or registration mechanism in which a sheet is supported on a sheet support such as a conveyor or the like constructed of a material having an electrical resistance which is detectably different than the resistance of the sheet. A moving mechanism is provided for moving a frame supporting the detecting apparatus and an object such as a cardboard box spaced from the sheet toward the sheet for aligning the sheet and box. The detecting apparatus electrically senses a change in resistivity when a portion thereof engages the edge of the sheet, and in response thereto substantially simultaneously disables the moving mechanism with the box precisely in register with the sheet.

3,749,633

APPARATUS FOR PRODUCING NONWOVEN FIBROUS PRODUCTS

John W. Soehngen, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Original application Sept. 21, 1966, Ser. No. 580,994, now Patent No. 3,607,588. Divided and this application July 1, 1971, Ser. No. 159,027
Int. Cl. B29h *9/00;* B29f *3/00*
U.S. Cl. 156—441 **3 Claims**



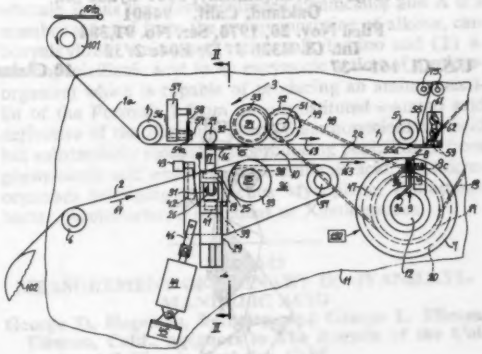
An apparatus for making fibrous products having a nozzle for spraying spinning filamentary material. An opposed pair of movable endless belts are spaced apart to form a gap. The nozzle is moved back and forth across the gap and aligned with the gap.

3,749,634

APPARATUS FOR SPLICING CIGARETTE PAPER WEBS

Lothar Krause, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed May 14, 1971, Ser. No. 143,700
Int. Cl. B31f *5/00;* B32b *31/20*
U.S. Cl. 156—505 **16 Claims**



A fresh cigarette paper web is connected with a travelling expiring web by accelerating the fresh web to a speed which is slightly less than the speed of the expiring web, by guiding the accelerated fresh web along a path which is spaced from an adjacent portion of the path for the expiring web, by placing between the two paths a uniting band which is coated with adhesive at both sides, by thereupon moving the travelling fresh web sideways to press it against the respective side of the uniting band while simultaneously pressing the other side of the band

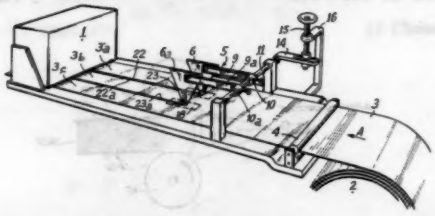
against the expiring web, and by thereupon severing the trailing portion of the expiring web behind the uniting band and the leading portion of the fresh web in front of the uniting band.

3,749,635

APPARATUS FOR CUTTING OUT AND WELDING A CONTINUOUSLY MOVING SHEATH MADE OF THERMOPLASTIC MATERIAL

Georges Lagain, 3 Rue des Sorbiers, 95 Ermont, France

Filed Sept. 29, 1970, Ser No. 76,445
Claims priority, application France, Oct. 9, 1969, 6934619
Int. Cl B30b *15/34*; B32b *31/00*
U.S. Cl. 156—515 5 Claims



The apparatus comprises cutters whose section has a width which varies as a function of their height and which have at least one sharp cutting portion, and which are connected to a heating means, said cutters are mounted on the frame of the machine by means permitting a displacement of the cutters along a plane perpendicular to the surface of the sheath.

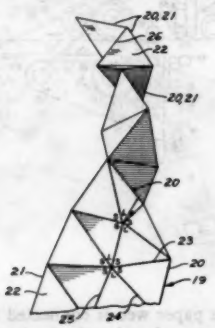
The invention may be used in machines for making plastic bags from sheaths.

3,749,636

CELL STRUCTRE OF INTERCONNECTED POLYHEDRONS IN PANELS, BEAMS AND OTHER STRUCTURAL COMPONENTS

George V. Tranquillitsky, 3161 Lynde St., Oakland, Calif. 94601

Filed Nov. 20, 1970, Ser. No. 91,384
Int. Cl. B32b *3/12*; E04c *2/32*
U.S. Cl. 161—37 10 Claims



A cell structure and method of fabricating the same. Cell structures embodying the invention may be used to fabricate panels, beams, and like components having utility in a great number of environments such as in the construction of side, floor and ceiling walls of a building and of material-handling pallets. Any such panel or beam structure comprises a plurality of sub-components or segments each constituted of a number of cells, with all of the segments forming any such panel or beam being connected one with another so as to define a panel or beam having the desired dimensions. Each such segment includes a plurality of cells in the form of substantially closed polyhedrons hingedly connected one with another in a string-like succession thereof; and each such string of polyhedrons is fabricated by scoring a continuous web of flat paper or paper-like material which is then folded along the score lines into a continuous string of interconnected polyhedrons. The folded web is then adhesively or otherwise constrained in the folded condition thereof to maintain the string-like succession of interconnected polyhedrons.

3,749,637

LAMINATES CONTAINING CROSS-LINKED ETHYLENE/CARBOXYLIC ACID COPOLYMER ADHESIVES

Joseph Edward Reardon and Vernon Clare Wolff, Jr., Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application July 19, 1968, Ser. No. 745,956, now abandoned. Divided and this application Jan. 20, 1971, Ser. No. 108,159
Int. Cl. B32b *27/38, 27/42*
U.S. Cl. 161—184 5 Claims

A laminate comprises at least two substrates and an adhesive having wet adhesion and heat resistance, especially two flexible substrates. The adhesive comprises a partially neutralized copolymer of ethylene and an alpha-beta ethylenically unsaturated carboxylic acid cross-linked with an epoxy resin of amino-formaldehyde resin.

3,749,638

FORMATION OF NON-WOVEN STRUCTURES FROM FIBROUS GLASS DISPERSION

Laurent C. Renaud, Woonsocket, R.I., and Clarence W. Charon, South Attleboro, Mass., assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,713
Int. Cl. D21h *5/18*
U.S. Cl. 162—145 20 Claims

A process for completely dispersing glass filaments with a minimum of filament breakage which produces stable dispersions in substantially a neutral solution which process includes dispersing the filaments in an acidic medium at a pH of from about 2.0 to about 2.5 to form a mixture, agitating the mixture and raising the pH of the mixture to about 4.5 to 6.5.

3,749,639

METHOD AND DEVICE FOR PRODUCING THERMONUCLEAR PLASMA

Petr Leonidovich Kapitza, Vorobievskoe Shosse 2, kv 14, Moscow, U.S.S.R.

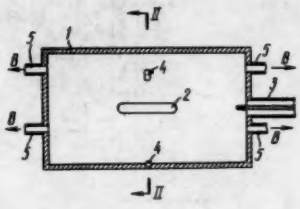
Filed Mar. 11, 1970, Ser. No. 18,592
Claims priority, application U.S.S.R., Aug. 22, 1969, 1,347,761, 1,347,762
Int. Cl. G21b *1/00*
U.S. Cl. 176—3 8 Claims

The invention relates to methods of producing a thermonuclear plasma and to devices for effecting the same.

The method for producing a thermonuclear plasma according to the present invention is characterized in that an electric discharge is created by high-frequency electromagnetic oscillations of such a mode and frequency that within the discharge zone there is provided a maximum concentration of the electric field, while a gaseous working medium is compressed and rotated about the horizontal axis of the electric discharge.

According to the invention, the device for effecting the proposed method comprises a resonant cavity and a cou-

pling element made so as to provide a maximum concentration of the electric field within the central portion of the resonant cavity and also comprises means for com-



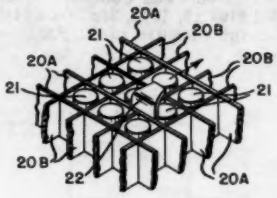
pression of the gaseous working medium inside the resonant cavity and for rotating it about the horizontal axis of the resonant cavity.

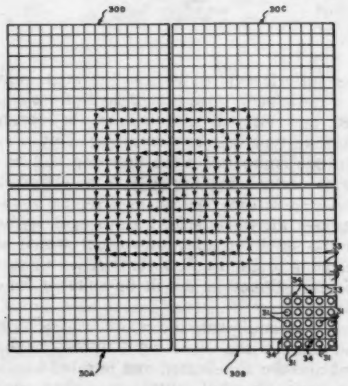
3,749,640

NUCLEAR REACTOR HAVING IMPROVED COOLANT REFLECTING ARRANGEMENT

Sanford L. Israel, Hartsdale, N.Y., assignor to United Nuclear Corporation, Elmsford, N.Y.

Filed June 2, 1970, Ser. No. 42,827
Int. Cl. G21c *15/04*
U.S. Cl. 176—78 **5 Claims**





In a liquid-cooled nuclear reactor, coolant deflectors are deployed in a pattern for deflecting the coolant into transverse flow streams which are parallel to the transverse power gradient among adjacent assemblies. In typical pressurized water reactors, these streams are concentric with respect to the intersection of adjacent nuclear fuel assemblies and are oriented so that adjacent concentric streams flow in opposite directions. This deployment of deflectors permits the operation of a reactor at a power level surprisingly higher than can be obtained from using coolant deflector deployments heretofore devised.

3,749,641

PRODUCTION OF 7-AMINO-3-METHYLCEPHEM COMPOUNDS

Takeshi Takahashi and Kenji Kawahara, Osaka, and Masao Isono, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 20, 1971, Ser. No. 210,105
Claims priority, application Japan, Dec. 25, 1970, 45/129,648
Int. Cl. C12b *1/00*
U.S. Cl. 195—29 **11 Claims**

Process for converting 7-acylamido-3-methyl-3-cephem-4-carboxylic acid or its ester to the corresponding 7-amino compound or its ester by bringing the 7-acylamido compound into contact with, for example, a culture broth of a microorganism belonging to the genus Escherichia, Bacillus, Xanthomonas, Pseudomonas, Protaminobacter, Mycoplana or Aeromonas. Also provided are the names of several other microorganisms useful in this process.

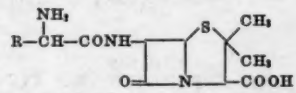
3,749,642

METHOD FOR THE PRODUCTION OF AMINOPENICILLINS

Takeshi Takahashi and Toshiyuki Takahashi, Osaka, and Masao Isono, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

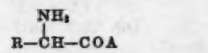
No Drawing. Filed Dec. 27, 1971, Ser. No. 212,655
Claims priority, application Japan, Dec. 25, 1970, 45/129,650
Int. Cl. C12d *9/00*
U.S. Cl. 195—29 **22 Claims**

A method for producing aminopenicillins of the formula



(I)

wherein R stands for a six-membered cyclic hydrocarbon residue optionally having one or more substituents on its ring, which comprises subjecting (1) an α-substituted-α-amino acid derivative of the formula



(II)

wherein R has the aforementioned significance and A is a member selected from the group consisting of alkoxy, carboxyalkylthio, amino and carboxyalkylamino and (2) 6-aminopenicillanic acid to an enzymatic action of a microorganism which is capable of producing an aminopenicillin of the Formula I from an α-substituted-α-amino acid derivative of the Formula II and 6-aminopenicillanic acid but substantially incapable of producing penicillin G from phenylacetic acid and 6-aminopenicillanic acid, the microorganism belonging to a genus Mycoplana, Protaminobacter, Acetobacter, Aeromonas or Xanthomonas.

3,749,643

MEASUREMENT OF URINARY D(—)VANILLYL-MANDELIC ACID

George D. Hegeman, Berkeley, and George L. Ellman, Tiburon, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

No Drawing. Filed Mar. 19, 1971, Ser. No. 126,295
Int. Cl. C12k *1/00*
U.S. Cl. 195—103.5 R **6 Claims**

A method for determining the amount of D(—)vanillylmandelic acid in human urine is described wherein D(—)vanillylmandelic acid is converted in the presence of an enzyme preparation containing D(—)vanillylmandelic acid dehydrogenase to vanillyl glyoxylate, some of the glyoxylate further converted in the presence of the enzyme preparation to vanillin. The amounts of vanillyl glyoxylate and vanillin thus formed can be quantitatively measured using standard spectrophotometric assay techniques.

3,749,644

ENZYME ASSAY BY METERING CHANGES OF STABLE FREE RADICALS

Richard S. Schneider, Sunnyvale, and Edwin F. Ullman, Atherton, Calif., assignors to Synvar Associates, Palo Alto, Calif.

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,726
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R 16 Claims

Compounds and method for assaying enzymes by adding to a medium containing an enzyme a stable free radical compound having a stable free radical functionality, bonded directly or indirectly to an enzyme labile functionality, which when subjected to an enzyme catalyzed reaction changes the environment of the free radical functionality. By following the change in the electron spin resonance (ESR) spectrum as affected by the change in environment, the type of enzyme and activity of enzyme may be determined.

3,749,645

FREE RADICAL ASSAY FOR REDOX ENZYMES

Richard K. Leute and Richard S. Schneider, Sunnyvale, Calif., assignors to Syva Corporation, Palo Alto, Calif.

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,707
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R 9 Claims

Method of assaying for enzymes capable of catalyzing a reaction involving electron transport—reductions or oxidations—by introducing a stable organic radical or radical precursor compound into a medium suspected of containing such an enzyme and metering any change in the electron spin resonance (ESR) spectrum of the medium.

3,749,646

METHOD AND APPARATUS FOR CONTINUOUS ADDITION OF A COMPONENT TO A REACTION SYSTEM

Stanley J. Pirt, London, England, assignor to National Research Development Corporation, London, England

Filed May 14, 1970, Ser. No. 37,285
Claims priority, application Great Britain, May 14, 1969, 24,688/69
Int. Cl. C12b *1/00*
U.S. Cl. 195—117 4 Claims

The invention relates to a method of continuous addition of a required component to a liquid chemical or biological system whereby the added component is diffused into the system during the chemical reaction or biological process from a sealed container immersed in the system. A particularly suitable container for use with the method is also described. The method can provide substantially constant rates of addition over relatively long periods.

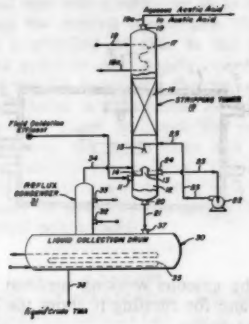
3,749,647

APPARATUS FOR STRIPPING SOLVENT FROM AND DEHYDRATING TRIMELLITIC ACID CONTENT OF FLUID EFFLUENT FROM CATALYTIC LIQUID PHASE OXIDATION OF PSEUDOCUMENE IN PRESENCE OF ACETIC ACID

Donald G. Micklewright, Crown Point, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 7, 1970, Ser. No. 95,659
Int. Cl. B01d *3/20, 3/26*
U.S. Cl. 202—153 6 Claims

Carryover of trimellitic acid or its intramolecular acid anhydride with stripped solvent and reflux of stripped solvent to dehydration of trimellitic acid are avoided by conduct of said stripping and dehydrating in a combination of (a) solvent stripping tower comprising a bottom reflux trap out zone, a solvent vaporizing zone, a solvent scrubbing zone, a solvent stripping zone and a dephlegmating zone and (b) a dehydration drum with hot reflux (knock-back) condenser and reboiler arranged to provide solvent vapors from dehydration drum to said scrubbing zone of said tower and one portion of liquid bottoms reflux from said trap out zone to dehydration drum and a second



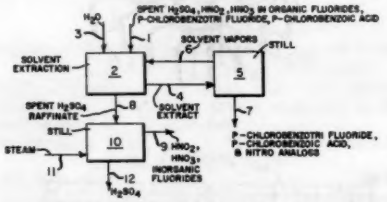
portion of said liquid bottoms reflux to solvent vaporizing zone.

3,749,648

RECOVERY OF SPENT SULFURIC ACID FROM CHLORINATED AND NITRATED BENZOIC ACID DERIVATIVES

Albert J. Boettler, Dyer, Allan M. Clarke, Griffith, and Roger W. Wheatley, Portage, Ind., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 19, 1971, Ser. No. 144,830
Int. Cl. B01d *15/00, 3/38*
U.S. Cl. 203—41 5 Claims



A waste sulfuric acid-water solution containing small amounts of nitric acid, nitrous acid, hydrofluoric acid and chlorinated and nitrated organics of the benzoic and benzotrifluoride type can be reconstituted by a recovery process. In one embodiment the first step will be solvent extraction to remove the organics from the waste acid. The second step will involve steam stripping of the waste acid to remove the nitric acid, nitrous acid, hydrofluoric acid, and the small quantity of solvent which was dissolved in the acid in the first step. After these process steps, the reconstituted acid will be suitable for normal industrial use.

In another embodiment, the waste acid is first steam distilled to remove the nitric acid, nitrous acid, hydrofluoric acid and the chlorinated and nitrated benzotrifluoride compounds. The still bottoms are then cooled and filtered to remove the benzoic acid compounds. The filtrate is the desired reconstituted acid.

3,749,649

BRIGHT TIN-LEAD ALLOY PLATING

Silvester P. Valayil, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,885
Int. Cl. C23b *5/38, 5/40, 5/46*
U.S. Cl. 204—43 S 44 Claims

This invention relates to the electrodeposition of tin-lead alloys; tin-lead alloy plating compositions; tin-lead

alloy plating baths; and to processes for the electrodeposition of tin-lead alloys in the presence of:

(a) at least one polyether surfactant; and
(b) at least one aromatic aldehyde exhibiting at least one chloro substituent or at least one compound producing an aromatic aldehyde exhibiting at least one chloro substituent.

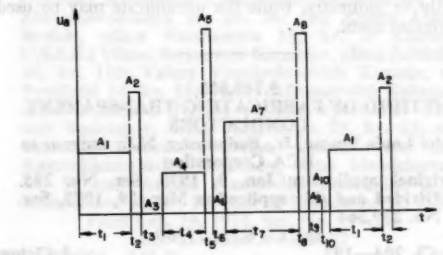
A preferred aspect of this invention lies in the electrodeposition of tin-lead alloys in the presence of a combination of:

(a) at least one polyether surfactant;
(b) at least one aromatic aldehyde exhibiting at least one chloro substituent or at least one compound producing an aromatic aldehyde exhibiting at least one chloro substituent;
(c) at least one aliphatic amine or at least one compound producing an aliphatic amine; and
(d) at least one anti-oxidant or oxygen acceptor.

3,749,650
METHOD OF ELECTRODEPOSITING GOLD ALLOYS

Manfred Dettke, Trautenstrasse 24, 1 Berlin 31, Germany; Rolf Ludwig, Bulowstrasse 19–22, 1 Berlin 30, Germany; and Wolfgang Riedel, Ludwigsfelder Strasse 7, 1 Berlin 37, Germany

Filed Apr. 14, 1972, Ser. No. 244,209
Claims priority, application Germany, Apr. 24, 1971, P 21 21 150.7
Int. Cl. C23b *5/42*
U.S. Cl. 204—44 **7 Claims**



Gold alloys of improved mechanical and electrical properties are electrodeposited cathodically from aqueous electrolytes on conductive articles by means of cyclically varying potentials, the potential in a first period of each cycle having a duration of at least 0.1 second being equal to the deposition potential of the alloy components, the potential in a second period of 10^{-3} to 10^{-4} second being much higher than in the first period, and the second period being followed by a third period of approximately 10^{-1} to 10^{-3} second in which there is no significant potential between the cathode and the electrolyte.

3,749,651
CAN STOCK WITH DIFFERENTIAL PROTECTIVE COATINGS

James E. Bird, Murrysville, and Paul R. Carter, Monroeville, Pa., assignors to United States Steel Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 840,519, July 9, 1969. This application Aug. 27, 1971, Ser. No. 175,728
Int. Cl. C23b *11/00*
U.S. Cl. 204—56 R **2 Claims**

Differentially treated differential tinplate having a trivalent chromium oxide coating thereon to the extent that about 1.00 to 1.50 mg. of chromium per square foot is provided on the heavily tinned side and about 0.40 to 0.80 mg. chromium per square foot is provided on the reverse lightly tinned side. The process involves the cathodic electrolysis of the differential tinplate in a dilute sodium-dichromate solution having a pH of from 3.5 to 5.5 at a temperature within the range 160 to 200° F. The heavily tinned side thereof is subjected to an electrical current of 100 to 170 coulombs per square foot while the reverse side is subjected to not more than 45 coulombs per square foot, at current densities within the range 10 to 170 amperes per square foot.

3,749,652
CRACK-FREE HARD CHROME

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

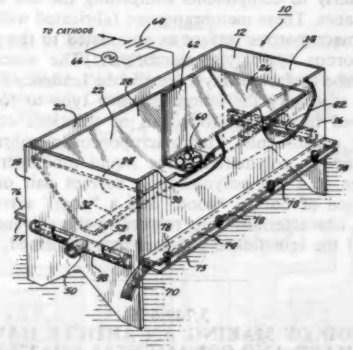
Filed Feb. 10, 1972, Ser. No. 225,218
The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed
Int. Cl. C22d *1/00;* **C23b** *5/06*
U.S. Cl. 204—105 R **1 Claim**

Chromium metal, formed under certain conditions of mechanical activation during electrodeposition, has a hardness in excess of 700 VPH_{100} and complete freedom from cracks in its structure both upon initial deposit and upon aging for at least a year.

3,749,653
PROCESS OF ELECTROLYTIC ETCHING

Charles J. Trzyna, Long Grove, and Quentin R. Krantz, Barrington Hills, Ill., assignors to Metalectric, Inc.

Filed Aug. 17, 1971, Ser. No. 172,505
Int. Cl. B01k *3/00;* **B23p** *1/10;* **C23b** *3/02*
U.S. Cl. 204—129.4 **8 Claims**



An electrolytic etching system of the type in which an anode-workpiece and a cathode are located in an electrolytic solution. The undesirable insulative coating which is generally provided on the cathode during etching is alleviated by applying an alternating electric potential across the workpiece-facing surface of the cathode while a voltage is simultaneously applied across the anode and cathode.

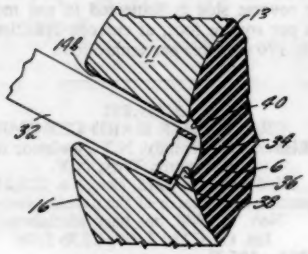
3,749,654
METHOD FOR ELECTROLYTICALLY MACHINING HOLES IN HOLLOW ARTICLES

Walter E. Mikulski, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 14, 1972, Ser. No. 217,848
Int. Cl. B23p *1/02, 1/16*
U.S. Cl. 204—129.65 **6 Claims**

In electrolytic machining of holes through the wall of a hollow article using a hollow electrode through which

an electrolyte is pumped, the article is filled with a dielectric material and the holes are then machined completely through the wall of the article. The dielectric material



prevents electrolyte from contacting the internal surface of the article after the holes break through the wall. After machining the holes the dielectric material is removed from the article.

3,749,655

ION EXCHANGE MEMBRANES HAVING A MACROPOROUS SURFACE AREA

Russell B. Hodgdon, Jr., Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

No Drawing. Filed June 21, 1971, Ser. No. 155,357

Int. Cl. B01d *13/02*

U.S. Cl. 204—180 P **3 Claims**

This invention is directed to electrodialysis equipment particularly to components comprising the ion exchange membranes. These membranes are fabricated with a polymeric macroporous surface as contrasted to the prior art microporous "gel" type membranes. The macroporous membrane surface or layer lessens the tendency for membranes especially the anion selective type to foul when employed in the electrodialysis of solutions containing fouling constituents. The macroporous membranes are obtaining by polymerizing the liquid monomers in the presence of a non-polymerizable solvent pair or diluent comprised of both a "good" and a "poor" solvent, said solvent characterized with respect to the solvents ability to swell the crosslinked polymer that is formed.

3,749,656

METHOD OF MAKING AN ARTICLE HAVING A HARD AND ORNAMENTAL COATING

Akio Hara and Shuji Yazu, Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

No Drawing. Filed Apr. 12, 1971, Ser. No. 133,382

Claims priority, application Japan, Apr. 20, 1970, 45/32,950

Int. Cl. B01k *5/02*; **C23b** *13/00*

U.S. Cl. 204—181 **9 Claims**

Beautiful and golden colored articles are effectively made by coating of tantalum carbide according to the invention. The coating is so hard that it is hardly scratched. The method comprises providing a dispersion of fine powders of tantalum or tantalum compound or mixed fine powders of the same with other materials in water, aqueous medium or organic solvent, applying a direct current voltage to the surface of a workpiece to be coated to thus cause electrophoretic deposition of the fine powders thereon, heating the coated surface at high temperatures in vacuum or in a reducing or inert atmosphere and thereby forming a coating layer consisting mainly of tantalum carbide.

3,749,657

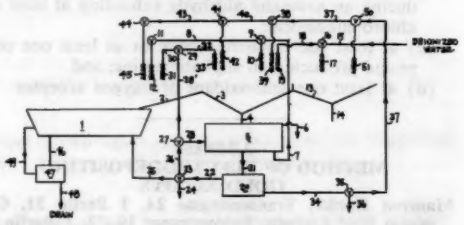
TREATMENT OF ELECTRODEPOSITION RINSE WATER

Louis R. Le Bras and Roger M. Christenson, Gibsonia, and Robert R. Zwack, New Kensington, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 71,798, Sept. 14, 1970, which is a continuation-in-part of application Ser. No. 886,004, Dec. 17, 1969, both now abandoned. This application Jan. 4, 1972, Ser. No. 207,701

Int. Cl. B01k *5/02*; **C23b** *13/00*

U.S. Cl. 204—181 **25 Claims**



This invention relates to a method of treating electrodeposition rinse water by removing at least a portion of the solids contained therein. The process of the invention comprises subjecting electrodeposition rinse water to ultrafiltration. The solids which are concentrated by the process, if desired, may be returned to the electrodeposition bath directly or indirectly, while the ultrafiltrate may be used as a rinsing agent.

3,749,658

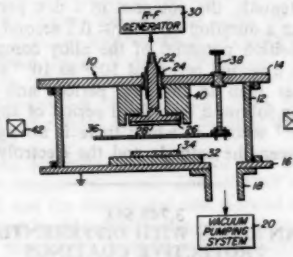
METHOD OF FABRICATING TRANSPARENT CONDUCTORS

John Louis Vossen, Jr., Bedminster, N.J., assignor to RCA Corporation

Original application Jan. 2, 1970, Ser. No. 295. Divided and this application Mar. 29, 1972, Ser. No. 239,364

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **4 Claims**



A sputtering target of 80 mole percent indium oxide and 20 mole percent tin oxide is radio-frequency sputter deposited on a substrate in an inert gas atmosphere to provide a high conductivity, anion deficient, tin doped In_2O_3 film. The film is then heated in an oxygen atmosphere for a period of time sufficient to form a stoichiometric, anion-full, oxide layer on the surface of the film; where the thickness of the oxide layer is self-limiting with

temperature so that the remainder of the anion deficient, high conductivity film under the oxide layer is not oxidized with future operation of the film in an oxidizing atmosphere at all lower temperatures.

3,749,659

REAGENT COMPOSITION FOR COULOMETRIC KARL FISCHER TITRATION

Harald Dahms, Ossining, N.Y., Gabor B. Levy, Westport, Conn., and David M. Seltzer, Little Neck, N.Y., assignors to Photovolt Corporation, New York, N.Y.

No Drawing. Original application Mar. 15, 1971, Ser. No. 124,534, now Patent No. 3,682,783. Divided and this application May 15, 1972, Ser. No. 253,648
Int. Cl. G01n *27/44*
U.S. Cl. 204—195 T 5 Claims

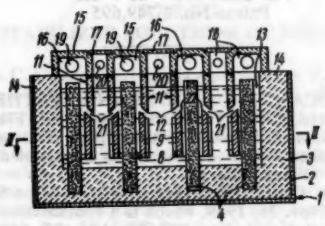
An improved reagent composition for coulometric titration of water by the Karl Fischer reaction comprises iodine, pyridine, sulfur dioxide and an inert organic solvent, the sulfur dioxide being present in a concentration of about 25 to about 50 percent by weight, and conveniently in about a 30-fold molar excess over the iodine. The reagent composition provides rapid coulometric titrations with minimal cycling at the endpoint.

3,749,660

ELECTROLYZER FOR PRODUCTION OF MAGNESIUM

Anatoly Vladimirovich Kolesnikov, ulitsa Juzhnoe shosse 2a, kv. 55, Zaporozhie, U.S.S.R.; Mikhail Mikhailovich Nikolaev, ulitsa Mendeleeva 20, kv. 68, Kamenogorsk, U.S.S.R.; Vladimir Pavlovich Sheka, ulitsa Khimikov 8, kv. 29, Berezniki Permskaya oblast, U.S.S.R.; Konstantin Dmitrievich Muzhzhavlev, ulitsa Zheleznovodskaya 48, kv. 30; and Khaim Lipovich Strelets, ulitsa Furmanova 19, kv. 2, Leningrad, U.S.S.R.; Viktor Sergeevich Kamenev, ulitsa Jubileinaya 46, kv. 110; Valery Vyacheslavovich Kuzmin, ulitsa Pyatiletki 24, kv. 18; Valery Afanasievich Kolesnikov, ulitsa Sverdlova 57, kv. 44; and Vyacheslav Vasilievich Bashkatov, ulitsa Jubileinaya 75, kv. 31, all of Berezniki Permskaya oblast, U.S.S.R.; and Murat Kazmukhametovich Baibekov, ulitsa Mendeleeva 10, kv. 9; and Arnold Vasilievich Kolomiitsev, ulitsa Mendeleeva 10, kv. 14, both of Kamenogorsk, U.S.S.R.

Filed Feb. 10, 1971, Ser. No. 114,116
Int. Cl. C22d *3/08, 3/02*
U.S. Cl. 204—243 R 4 Claims



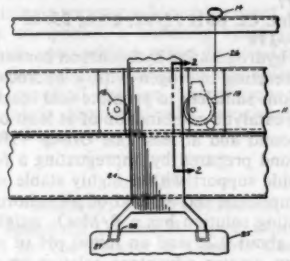
The present invention relates to electrolyzers for production of magnesium, having cathodes completely immersed in the electrolyte bath. In accordance with the invention, each of the cathodes, with the exception of the outermost two, encloses the associated anode thereinside, the internal surface of the cathode being congruent with the surface of the anode. With the cathodes constructed in this manner, the yield of electrolyte per unit of the surface of the electrolyzer is increased by 10 to 12 percent, and even higher.

3,749,661

ANODE TRANSPORT FRAME LOCKING DEVICE

Henry S. Cook, 2941 Frederia St., Owensboro, Ky. 42301, and Sam L. Smith, R.R. 3, Lewisport, Ky. 42256

Filed Aug. 4, 1971, Ser. No. 168,878
Int. Cl. C22d *3/12*; B66c *1/00*
U.S. Cl. 204—286 5 Claims



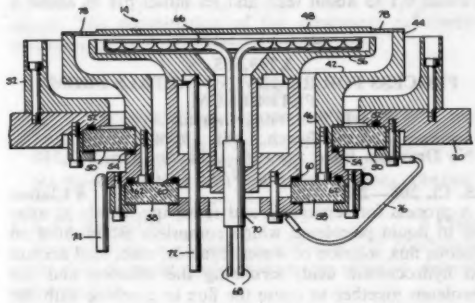
An apparatus for locking an anode shaft into a transport frame comprising an idler wheel mounted for rotation on the transport frame, an eccentric wheel mounted for rotation on the transport frame in the same horizontal plane and opposite the idler wheel, and a stop plate fixedly attached to the eccentric wheel. As an anode shaft is lowered into the transport frame between the engaged eccentric wheel and the idler wheel, the eccentric wheel is rotated by the downward movement of the shaft and exerts sufficient pressure against the shaft to halt excessive downward movement. As the eccentric wheel rotates the stop plate is rotated to a position directly in front of the anode shaft, thereby preventing any forward movement by the shaft.

3,749,662

HEATED SUBSTRATE SUPPORT STATION FOR SPUTTERING SYSTEMS

Richard E. Biehl, Pearl River, N.Y., assignor to Materials Research Corporation, Orangeburg, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,563
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 10 Claims



An improved substrate support for sputtering systems permits simultaneous heating and application or either direct current or radio frequency bias voltages to the substrates. The station includes a hollow support electrode having a flat surface for receiving the substrates. The electrode is attached to a vacuum chamber by a combined electrical insulating and vacuum sealing means. An inner dark space shield mounted within and insulated from the support electrode prevents glow discharge from the internal surfaces of the electrode and also provides a shielded recess for radiant heating means.

3,749,663
HYDROGENATIVE HYDROCARBON CONVERSION

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 837,340, June 27, 1969, which is a continuation-in-part of application Ser. No. 761,322, Sept. 20, 1968, both now abandoned. This application Apr. 1, 1971, Ser. No. 130,477

Int. Cl. B01i *11/82;* **C10g** *23/02*

U.S. Cl. 208—110 **13 Claims**

A superior hydrogenative hydrocarbon conversion process includes reacting hydrogen with a hydrocarbon feed under conditions sufficient to promote said reaction in the presence of a catalytic combination of at least one molybdenum compound and at least one Group VIII metal or metal compound prepared by impregnating a foraminous refractory oxide support with a highly stable solution of the metal compounds and an acid of phosphorus wherein the impregnating solution has a P/MoO_3 weight ratio of about 0.1 to about 0.25 and an initial pH of about 1 to about 2. Even greater advantage relative to previously available hydrogenative hydrocarbon conversion systems is realized when operating on feedstocks containing substantial amounts of organonitrogen and/or aromatic compounds.

3,749,664
HYDROGENATIVE DENITROGENATION

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 837,340, June 27, 1969, which is a continuation-in-part of application Ser. No. 761,322, Sept. 20, 1968, both now abandoned. This application Apr. 1, 1971, Ser. No. 130,476

Int. Cl. C10g *17/00*

U.S. Cl. 208—254 H **12 Claims**

Hydrocarbons containing organonitrogen compounds are denitrogenated by reacting hydrogen with the hydrocarbon feed under denitrogenation conditions in the presence of a catalytic combination of at least one molybdenum compound and at least one Group VIII metal or metal compound prepared by impregnating a foraminous refractory oxide support with a highly stable solution of the metal compounds and an acid of phosphorus wherein the impregnating solution has a P/MoO_3 weight ratio of about 0.1 to about 0.25 and an initial pH of about 1 to about 2.

3,749,665
PROCESS FOR REMOVING METALS FROM PETROLEUM

David Bell, 6441 Cerritos Ave., Long Beach, Calif. 90805

No Drawing. Filed Apr. 10, 1972, Ser. No. 242,766

Int. Cl. C10g *29/00, 29/02*

U.S. Cl. 208—253 **6 Claims**

A process for separating and removing metals in solution in liquid petroleum which comprises establishing an aqueous flux solution of water, cyanide, zinc, lead acetate and hydrochloric acid; scrubbing the solution and the petroleum together to cause the flux to combine with the metals in the petroleum and establish a fuse and, finally, separating the petroleum, solution and fuse.

3,749,666
METHOD FOR THE IMPROVEMENT OF PETROLEUM DISTILLATE

William H. Lockwood, Jr., Hightstown, and Hugh P. Herbert, Trenton, N.J., assignors to Cities Service Oil Company

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,742

Int. Cl. C10g *29/00*

U.S. Cl. 208—278 **8 Claims**

A process for improving petroleum distillate quality is disclosed. In particular, sulfuric acid and cracking catalyst are utilized to remove impurities which cause instability and poor color characteristics in petroleum distillates. The distillate is emulsified with acid, preferably spent sulfuric acid alkylation catalyst, and spent cracking catalyst with subsequent removal of the supernatant liquid. The improved petroleum distillate is then available for use or blending with other distillate streams.

3,749,667
DISPOSAL OF OIL SPILL AT SEA

Olle B. Lindstrom, Lorensviksvagen 14, Taby, Sweden

No Drawing. Filed Nov. 18, 1971, Ser. No. 200,162

Claims priority, application Sweden, July 9, 1971, 8,899/71

Int. Cl. E02b *15/04*

U.S. Cl. 210—36 **8 Claims**

Method for disposing of oil spilled at sea by first burning the oil and thereafter applying an inorganic sinking agent. The sinking agent particles, less than 50 mm. in size, are dispersed over the burning oil and become coated with the oil residue which is absorbed onto the particles as they sink. The sinking agent particles may be sand, gravel, chalk, gypsum, slag of heavy materials like iron ore, and the like.

3,749,668
WATER PURIFICATION WITH AMINE OXIDE RESINS

Robert Winn Walker, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Original application Aug. 19, 1969, Ser. No. 851,456, now abandoned. Divided and this application May 3, 1971, Ser. No. 139,965

Int. Cl. C02b *1/60*

U.S. Cl. 210—37 **3 Claims**

Resins containing aliphatic or non-heterocyclic aromatic tertiary amine groups which have been converted to the corresponding tertiary amine oxide groups exhibit little or no volume change during acid and base cycling operations and have much greater physical stability The amine oxide containing resins are useful as weakly basic anion exchange resins and as adsorbents for removing polar compounds from non-polar compounds.

ERRATUM

For Class 252—4.5 F see:
Patent No. 3,749,695

3,749,669
LUBRICANTS FOR HIDES AND LEATHER

Fred P. Luvisi, Elkins Park, and Edward M. Filachione and William J. Hopkins, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation-in-part of application Ser. No. 880,432, Nov. 26, 1969, which is a continuation-in-part of application Ser. No. 482,639, Aug. 25, 1965, both now abandoned. This application June 21, 1971, Ser. No. 155,339

Int. Cl. C14c *9/02*

U.S. Cl. 252—8.57 **6 Claims**

A lubricating agent for hides and leathers in the form of an emulsion containing, in aqueous medium, from 0.25% to 2.0% of a water-insoluble, oil-soluble polar substances such as alkylated or alkenylated succinic acids or anhydrides or mixtures of such substances and other oils, from 5% to 25% of a water-soluble polar organic compound or mixtures of such compounds, and enough water to make a 50% float. The amount of each ingredient is based on the wet drained weight of wet leather to be

lubricated. The water-soluble, polar organic compound serves only to disperse the water-insoluble, oil-soluble polar substances or such substances and other oils throughout the aqueous medium to produce an emulsion and is not absorbed into the hide or leather being lubricating but remains behind in the float.

3,749,670

ELECTROSTATIC LIQUID DEVELOPER CONTAINING DYE COATED CARBON PARTICLES

Mary K. Ormsbee, River Forest, Ill., Mouin I. Saadeh, Daly City, Calif., and Leonard Skulby, Mundelein, Ill., assignors to A. B. Dick Company, Niles, Ill.

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,676

Int. Cl. G03g 9/04

U.S. Cl. 252—62.1 **3 Claims**

New and improved toner particles for use in a liquid developing composition for converting a latent electrostatic image to a visible image and method for their preparation wherein carbon pigment material is treated with a dye carrying a positive electrostatic charge dissolved in a polar organic solvent.

3,749,671

PROCESS OF PRODUCING ENZYME COMPOSITIONS

Burton H. Gedge III, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed July 1, 1971, Ser. No. 159,032

Int. Cl. C11d 7/42

U.S. Cl. 252—89 **12 Claims**

Prills comprising an enzyme and a normally solid water-soluble translucent material are made by a process wherein the resultant prills have a relatively light color. A slurry of the enzyme and normaly solid water-soluble translucent material is injected with an inert gas and then made into prills by any prilling method. An especially preferred method of making the prills is by spray cooling. The inert gas injection step prior to prilling results in prills having a Hunter color L-value of about L–70 to L–90, significantly higher than the L-value of prills made by a prilling technique not employing the inert gas injection step. Each of the resultant prills is in the form of a substantially spherical shape having a substantially smooth outer surface and porous interior.

3,749,672

STABILIZED SOLUTIONS OF N-HALO COMPOUNDS

William C. Golton, Springfield, and Andrew F. Rutkiewic, West Chester, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 6,540, Jan. 28, 1970, which is a continuation-in-part of application Ser. No. 768,165, Oct. 16, 1968, which in turn is a continuation-in-part of application Ser. No. 729,461, May 15, 1968, all now abandoned. This application Apr. 19, 1971, Ser. No. 135,373

Int. Cl. C11d 7/54

U.S. Cl. 252—95 **12 Claims**

Described and claimed are stable aqueous systems containing an N-hydrogen compound and a hypobromite, hypochlorite or hypoiodite in equilibrium with the corresponding N-halo compound or compounds. Stability is provided by inclusion of a buffer which maintains pH of the system between 4 and 11. The systems can be used wherever gradual release of active halogen is desired, e.g. as household laundry or industrial bleaches or as agents for control of micro-organisms in process water streams.

3,749,673

BLEACH-FABRIC SOFTENER COMPOSITIONS

John Paul Jones and Charles H. Nicol, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 22, 1971, Ser. No. 117,590

Int. Cl. C11d 7/54

U.S. Cl. 252—95 **8 Claims**

Concentrated, dry bleach and fabric-softening compositions containing a peroxygen bleaching agent, a quaternary ammonium compound, a buffering agent and ionizable chlorine. Such compositions when dissolved in water provide fast-acting catalyzed bleaching and softening of textiles at all practical solution temperatures without the color and fabric damage usually associated with harsh hypochlorite bleaches.

3,749,674

BLEACH COMPOSITIONS

John Paul Jones and Charles H. Nicol, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,814

Int. Cl. C11d 7/54

U.S. Cl. 252—95 **8 Claims**

Concentrated, dry bleach and fabric-softening compositions containing a peroxygen bleaching agent, a quaternary ammonium compound and a buffering agent. Such compositions when dissolved in water provide fast-acting, chlorine-free, catalyzed bleaching and softening of textiles at all practical solution temperatures without the color and fabric damage usually associated with harsh active chlorine bleaches.

3,749,675

PHOSPHATE-FREE DETERGENTS

Edward H. Chang, Burnsville, Minn., assignor to Fremont Industries, Inc., Shakopee, Minn.

No Drawing. Filed Nov. 12, 1970, Ser. No. 89,146

Int. Cl. C11d 1/72, 3/00, 3/08

U.S. Cl. 252—135 **1 Claim**

A phosphate-free general purpose laundry detergent based substantially upon the sodium salt of citric acid and containing a builder substance, the builder substance being a polyalkylene glycol ether which is the reactant product of a hydrophobic reactant and a hydrophilic reactant. The combination of the substances provides an optimized general purpose laundry detergent.

3,749,676

DETERGENT COMPOSITIONS

Marvin M. Crutchfield, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,806

Int. Cl. C11d 3/04

U.S. Cl. 252—135 **3 Claims**

Formulations comprising a surfactant in combination with dialkali metal ketomalonate are effective detergent compositions.

3,749,677

CHEMILUMINESCENT REACTION OF SUBSTITUTED 2,2,3,3-TETRACHLORO-1,4-BENZODIOXANE

Donald Roy Maulding, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,294

Int. Cl. C09k 3/00

U.S. Cl. 252—188.3 CL **5 Claims**

Novel substituted benzodioxane compounds which provide chemiluminescent light when reacted with other

necessary chemiluminescent reactants in the direct generation of light from chemical energy. By "light" as referred to herein is meant electromagnetic radiation at wavelengths falling between about 350 mμ and about 1,000 mμ.

3,749,678
RATE STABILIZERS FOR CHEMICAL OXYGEN GENERATORS

Tommy Lewis Thompson, Melbourne, Fla., assignor to Life Support, Inc., Melbourne, Fla.

Continuation-in-part of application Ser. No. 138,299, Apr. 28, 1971, now Patent No. 3,702,305, which is a continuation-in-part of abandoned application Ser. No. 66,555, Aug. 24, 1970. This application Sept. 15, 1971, Ser. No. 180,745

Int. Cl. A62b *21/00;* **C01b** *13/02*

U.S. Cl. 252—187 R **20 Claims**

Chemical oxygen generators made from an alkali metal chlorate such as sodium chlorate and sodium or potassium oxides as catalysts can be made to produce a relatively steady flow of oxygen if there is incorporated in the mixed composition a small amount of material such as powdered glass, silica or mica. In the absence of these materials the rate of oxygen flow is unsteady, whereas the addition of about .5 to 6% by weight of these materials produces a relatively steady flow of oxygen over the life of the composition.

3,749,679
CARBOALKOXY SUBSTITUTED BIS-PHENYL OXALATES AS SUPERIOR CHEMILUMINESCENT MATERIALS

Michael McKay Rauhut, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 842,134, July 16, 1969. This application Mar. 15, 1971, Ser. No. 124,142

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 **10 Claims**

New compounds which are ester substituted bis(aryl) oxalate esters. The compounds are reactive with hydrogen peroxide in the presence of a solvent and a fluorescer to give visible chemiluminescent light.

3,749,680
NOVEL DERIVATIVES OF ISOASCORBIC ACID AND METHODS OF PRODUCING AND USING SAME

David F. Hinkley, Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Apr. 16, 1969, Ser. No. 816,771, now abandoned. Divided and this application Jan. 8, 1971, Ser. No. 105,082

Int. Cl. C07d *5/12*

U.S. Cl. 252—400 A **5 Claims**

Novel isoascorbic acid phosphates and salts thereof, useful as antioxidants, are prepared by phosphorylating 5,6-O-loweralkylidene isoascorbic acid. Also, antioxidant compositions and methods of inhibiting oxidation in preserved foods and beverages are included.

3,749,681
CATALYST FOR SELECTIVE HYDROGENATION OF POLYUNSATURATED VEGETABLE OILS

Sambasivarao Koritala, Peoria, Ill., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 26, 1971, Ser. No. 119,378

Int. Cl. B01j *11/82*

U.S. Cl. 252—438 **2 Claims**

A catalyst is described which will selectively reduce the linolenate moiety of polyunsaturated vegetable oils. The catalyst is particularly characterized as having excellent reuse properties. A procedure for the preparation of this highly active catalyst by chemisorption of copper-ammonium complex on silica gel is also described.

3,749,682
DETERGENT COMPOSITION

Emil Tanner, Basel, Switzerland, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed July 23, 1971, Ser. No. 165,584

Claims priority, application Great Britain, Aug. 12, 1970, 38,797/70

Int. Cl. C11d *3/28*

U.S. Cl. 252—524 **6 Claims**

A detergent composition with good anti-soil-redeposition characteristics for synthetic and similar fabrics is provided by incorporating therein a small proportion of a copolymer of vinylpyrrolidone and vinylacetate. Generally the vinylpyrrolidone/vinylacetate copolymers incorporated have an average molecular weight within the range of about 10,000 to about 400,000, preferably from about 20,000 to about 200,000.

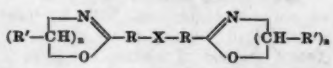
3,749,683
BI-2-OXAZOLINE AND OXAZINE ETHERS AND THIOETHERS

Donald A. Tomalia and Janet N. Paige, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

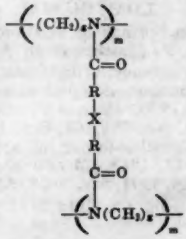
No Drawing. Application Sept. 29, 1970, Ser. No. 76,598, which is a division of application Ser. No. 834,611, June 16, 1969. Divided and this application Jan. 24, 1972, Ser. No. 220,446

Int. Cl. C08g *30/14*

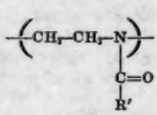
U.S. Cl. 260—2 N **5 Claims**



wherein R is alkylene, phenylene, vinylene, or phenylene-alkylene, wherein, "alkylene" alone or in a combined name, designates an alkylene moiety that is of from 1 to 10 carbon atoms, and X is —S— or —O—; *n* is zero or 1; optionally also with an oxazoline as comonomer, are cationically polymerized to polymers containing recurring units of the formula



and, optionally, also units of the formula



wherein g is an integer 2 or 3, m represents the degree of polymerization, and R' is hydrogen or a specified radical.

3,749,684

RESINS WITH TERTIARY AMINE OXIDE FUNCTIONALITY

Robert Winn Walker, 6008 Cannon Hill Road, Fort Washington, Pa. 19034

No Drawing. Continuation of abandoned application Ser. No. 851,456, Aug. 19, 1969. This application July 15, 1971, Ser. No. 163,094

Int. Cl. C08f *27/22, 19/20*

U.S. Cl. 260—2.1 E 18 Claims

Resins containing aliphatic or non-heterocyclic aromatic tertiary amine groups which have been converted to the corresponding tertiary amine oxide groups exhibit little or no volume change during acid and base cycling operations and have much greater physical stability. The amine oxide containing resins are useful as weakly basic anion exchange resins and as adsorbents for removing polar compounds from non-polar compounds.

3,749,685

MICROPOROUS VINYL CHLORIDE POLYMERS AND PROCESS FOR PRODUCING

William R. Johnson, Jr., Richmond, Va., and Leonard M. Davis, Jr., Poughkeepsie, N.Y., assignors to Philip Morris Incorporated, New York, N.Y.

No Drawing. Continuation of application Ser. No. 26,763, Apr. 8, 1970. This application Jan. 26, 1972, Ser. No. 221,111

Int. Cl. C08f *47/08, 29/18;* A24d *1/06*

U.S. Cl. 260—2.5 M 5 Claims

This disclosure relates to a novel process and to novel products. The products comprise a vinyl chloride polymer having an improved microreticulated structure and are made by a process which comprises forming a dispersion of vinyl chloride polymer particles in water containing a water-soluble thickening agent, preferably deaerating the dispersion under reduced pressure and heating of the dispersion to sinter the vinyl chloride polymer particles and to form a microreticulated, microporous structure. The products of this invention are particularly useful as filter materials, especially as cigarette filters; and the process of the invention is especially suited for the formation of shaped porous articles which are useful as filters.

3,749,686

OIL MODIFIED POLYURETHANE COATINGS

Joseph A. Pawlak, Cheektowaga, Buffalo, and Claude Thomas Bean, Jr., Niagara Falls, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 537,687, Mar. 28, 1966. This application Feb. 22, 1971, Ser. No. 117,811

Int. Cl. C08g *5/20*

U.S. Cl. 260—19 A 11 Claims

This invention relates to oil modified polyurethane coatings and the process for making said coatings, comprising the steps of reacting from about 0.95 to 1.1 isocyanate groups on an organic polyisocyanate with each hydroxyl group on a polyol, wherein the polyol is formed by reacting from 1.1 to 4 moles of phenol with each mole of an aldehyde so as to form a novolak resin which has from about 1.1/1 to 2/1 phenolic groups per aldehydic group per molecule, alkylating the novolak resin with from about 0.1 to 2 moles of alkylating agent per mole of phenolic nucleus on the novolak resin, hydroxyalkylating the novolak resin with from about 1 to 6 moles of hydroxyalkylating agent per mole of phenolic hydroxyl on the novolak resin, and esterifying or transesterifying the hydroxyalkylated product with from 0.33 to 1 mole of esterifying or transesterifying agent per mole of hydroxyl on the hydroxyalkylated product. Varnishes and other coatings can be prepared from the oil modified polyurethanes of this invention and exhibit superior resistance to caustic.

3,749,687

FILL-IN COMPOSITIONS CONTAINING AN ORGANIC RESINOUS FILM-FORMING MATERIAL, AN ORGANIC SOLVENT, AND A WAXY MATERIAL

Lester Aronberg, Chicago, and Donald B. Lytton, Lincolnwood, Ill., assignors to Lake Chemical Company, Chicago, Ill.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,129

Int. Cl. C08f *45/52*

U.S. Cl. 260—23 TN 6 Claims

Compositions, preferably in stick or pencil form, having particular utility for filling scored, nicked, scratched, stamped, carved, engraved, or the like, surfaces, comprising an organic resinous film-forming material, an organic solvent in which the resinous film-forming material is soluble, and a waxy material which is substantially insoluble in the organic solvent at least at ordinary or room temperatures.

3,749,688

MODIFIED COAL-TAR-PITCH COMPOSITIONS AND PROCESS FOR PREPARING SAME

Edward L. Mihelic, Penn Hills Township, Allegheny County, and Marcus S. Morgan, Mount Lebanon Township, Allegheny County, Pa., assignors to United States Steel Corporation

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,497

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 5 Claims

This invention relates to plastic coating materials, to coal-tar-pitch-derived baked protective-coating materials that are heat and solvent resistant, to semirigid thermosetting foams prepared from expandable coal-tar-pitch-polyester compositions, and to procedures for preparing such materials.

3,749,689

POLYESTER COMPOSITION AND METHOD OF MANUFACTURING THE SAME

Silvio Vargiu, Sesto San Giovanni, Beppino Passalenti, Milan, and Pierluigi Abruzzi, Bergamo, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,024

Claims priority, application Italy, Dec. 23, 1969, 26,199/69

Int. Cl. C08f *45/24;* C09d *5/02*

U.S. Cl. 260—29.6 NR 14 Claims

Unsaturated liquid polyester compositions are stabilised by aromatic organic compounds containing phenolic hydroxyl and tertiary amine groups in the molecule.

3,749,690

AQUEOUS INTERPOLYMER EMULSIONS AND USE THEREOF IN LATEX PAINTS

Ralph F. Patella, South Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,107

Int. Cl. C09d *3/80, 5/02*

U.S. Cl. 260—29.6 TA 7 Claims

An aqueous tetrapolymer emulsion derived from the interpolymerization of a short-chain alpha,beta-unsaturated mono- or polycarboxylic acid, acrylonitrile, a short-chain alpha,beta-unsaturated amide, and an alkyl acrylate, when combined with a pigment, provides a latex paint which, when applied to a surface and cured, forms a decorative coating exhibiting a high degree of burnish resistance, scrub resistance, ease of stain removal, and low temperature coalescence.

3,749,691

DETERGENT-COMPATIBLE, FABRIC-SOFTENING COMPOSITIONS

Thomas V. Kandathil, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

No Drawing. Filed Dec. 31, 1970, Ser. No. 103,275
Int. Cl. C11d *3/28*; D06m *15/26*
U.S. Cl. 260—29.6 XA 11 Claims

Aqueous, detergent-compatible, fabric-softening compositions are described as comprising (A) a cationic softening agent, (B) an amphoteric surfactant, and (C) a modified polyolefin emulsion.

3,749,692

AQUEOUS LATEX CAULKING COMPOSITION

Peter C. Scocos, Willowick, and Frank L. Miller, Warrensville Heights, Ohio, assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed June 22, 1971, Ser. No. 155,635
Int. Cl. C08d *11/02*; C08f *45/28*; C09d *5/02*
U.S. Cl. 260—29.6 MH 5 Claims

In a plasticized aqueous latex caulk containing solid filler paintability of the cured surface can be improved by using as about 60–80 weight percent of the plasticizer components a polybutene having average molecular weight of about 400–500, viscosity of about 150–300 centistokes at 100° F., and pour point not substantially higher than about —20° F.

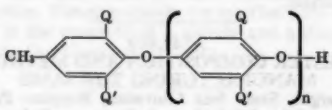
3,749,693

PROCESS FOR THE PREPARATION OF POLYPHENYLENE ETHERS AND COMPOSITIONS CONTAINING THE SAME

Glenn D. Cooper, Delmar, N.Y., assignor to General Electric Company

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,195
Int. Cl. C07c *47/20*; C08g *23/18*
U.S. Cl. 260—47 ET 7 Claims

A process for the preparation of 2,6-disubstituted-1,4-phenylene ether dimers, oligomers and polymers, such as those of the formula:



wherein Q and Q' are selected from the group consisting of lower aliphatic radicals having from 1–4 carbon atoms and phenyl; and *n* is a whole integer of from 1 to about 300, which comprises polymerizing a suitable monomer in the presence of oxygen and a copper-amine catalyst. The high molecular weight products are engineering thermoplastics, and the low molecular weight products are oxidation stabilizers and melt viscosity improvers for thermoplastics.

3,749,694

STABILIZATION OF TEXTILE FIBERS, FILMS AND OTHER SHAPED OBJECTS OF POLYMERIC ALPHA-OLEFINS

Giuseppe Cantatore, Collescipoli, Terni, and Millo Branchesi, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed May 3, 1971, Ser. No. 139,919
Claims priority, application Italy, May 4, 1970, 24,148/70
Int. Cl. C08f *45/62*
U.S. Cl. 260—41 R 9 Claims

Polymeric compositions based on polyolefins and comprising nickel and sulphur-containing stabilizers are protected against discoloration during processing at high temperatures by incorporating in the compositions a phosphorus derivative having the general formula:

$$X[PO(OR)\ (OR')]_n$$

in which R and R' which may be the same or different, represent hydrogen, alkyl radicals containing from 1 to 18 carbon atoms, or aryl or alkaryl radicals containing from 6 to 18 carbon atoms; X is an alkyl, aryl, alkylaryl, acyl radical of valency *n*, which may contain a heteroatom such as O, S, N, P and the like, and substituent groups such as hydroxy, alkoxy, phenoxyalkyl, carbalkoxy, acyl, amino, alkylamino, arylamino, alkylmercapto. An exemplary phosphorus derivative within the scope of the invention is diethylbenzyl-phosphonate.

The stabilization against heat, light and ageing of fibers, films, raffia and other manufactured articles based on alphaolefin polymers, in particular of articles formed of polypropylene consisting essentially of isotactic macromolecules, is disclosed.

3,749,695

LUBRICATING OIL ADDITIVES

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,293
Int. Cl. C10m *1/38*, *1/32*
U.S. Cl. 252—47.5 1 Claim

Lubricating oil compositions are provided containing effective detergents and dispersants which are the reaction products of hydrocarbyl-substituted polyamines or succinimides with alkane sultones.

3,749,696

NOVEL CATALYST SYSTEMS IN HIGH MOLECULAR WEIGHT POLYESTERS

Eugene E. Berkau, Cincinnati, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 26, 1970, Ser. No. 66,957
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R 3 Claims

In the production of ultra-high molecular weight, thermally stable polyethylene terephthalate, pre-polymers of polyethylene terephthalate comprising oligomers of terephthalic acid and ethylene glycol and mono and bis-esters of terephthalic acid and ethylene glycol are transesterified in the presence of complementary catalytic amounts of antimony, and alkali metal salts of a weak acid, or hydroxide.

3,749,697

POLY(ETHYLENE TEREPHTHALATE) POLYESTER WITH LOWER DIETHYLENE GLYCOL CONTENT

Kenneth T. Barkey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,365
Int. Cl. C10g *17/013*
U.S. Cl. 260—75 R 5 Claims

Formation of contaminant diethylene glycol by-product during manufacture of poly(ethylene terephthalate) prepolymer by ester exchange of dimethyl terephthalate and ethylene glycol in the presence of a catalyst mixture is minimized by including lithium acetate dihydrate as an essential ingredient in the catalyst mixture when the catalyst mixture consists of zinc acetate dihydrate or antimony trioxide, alone or together, as the catalyst or catalysts for said manufacture.

3,749,698

TREATMENT OF POLYAMIDE GRANULES WITH FORMIC ACID

Gunter Lehmann, Saarbrucken, Otto Neunhoeffer, Homburg, Saar, and Wilhelm Roselius and Otto Vitzthum, Bremen, Germany, assignors to HAG Aktiengesellschaft, Bremen, Germany

No Drawing. Filed Apr. 30, 1971, Ser. No. 139,192
Claims priority, application Germany, May 5, 1970, P 20 22 026.2
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 S 13 Claims

Inactivated polyamide granules are reactivated and exhibit improved absorptivity by treatment with formic acid,

such as an aqueous formic acid solution having a concentration in a range about 40–70% by weight formic acid, at a temperature in the range 0–80° C. The formic acid treatment is usually carried out for a period of from about one to eight hours. After treatment resulting polyamide granules are separated such as by filtration and rinsed with water.

3,749,699

LIGHT-SENSITIVE MIXED ESTERS OF POLYVINYL ALCOHOL

Joseph E. Apellaniz, Glen Cove, N.Y., assignor to Power Chemco Inc., Glen Cove, N.Y.

No Drawing. Filed Jan. 7, 1971, Ser. No. 104,803

Int. Cl. C08f *27/12*

U.S. Cl. 260—79.3 R **7 Claims**

Light-sensitive film forming polymers are disclosed which comprise recurring units of benzoate- and furoate-esterified polyvinyl alcohol as well as their utilization as photographic resist materials and printing plates for lithography.

3,749,700

POLY(PHENYLENECARBIDES)

Robert D. Stephens, Berkeley, and William C. Kray, Jr., Richmond, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 688,975, Dec. 8, 1967. This application July 6, 1970, Ser. No. 52,735

Int. Cl. C08f *9/00*

U.S. Cl. 260—80 P **3 Claims**

Poly(o-phenylenecarbide) and poly(m-phenylenecarbide) are novel polymers. They are fusible, soluble in a variety of solvents, and are also convertible by thermal treatment at an elevated temperature to a carbon structure which is dimensionally stable and extremely resistant to loss of weight at temperatures as high as 1000° C. These novel polymers are capable of dissolving large amounts of compounds of certain transition metals. Upon thermal treatment, such solid solutions provide a carbon structure having metal compound homogeneously distributed therein as submicroscopic particles.

3,749,701

ACRYLONITRILE COPOLYMERS

Helmut Engelhard, Leverkusen, Francis Bentz, Cologne, and Dieter Brokmeier and Gunther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

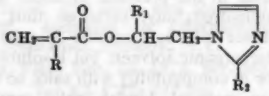
No Drawing. Filed May 10, 1971, Ser. No. 141,959

Claims priority, application Germany, May 14, 1970, P 20 23 546.5

Int. Cl. C08f *15/22*

U.S. Cl. 260—80.72 **24 Claims**

Acrylonitrile copolymers having high affinity for acidic and metal complex dyes, containing, in copolymerized form, up to 40% by weight of a comonomer of the formula



The copolymers are useful for the production of fibers and films.

3,749,702

LUBRICANT ADDITIVE

Raymond H. Boehringer and Robert E. Vail, Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Original application Aug. 14, 1968, Ser. No. 755,495. Divided and this application Mar. 31, 1971, Ser. No. 130,032

Int. Cl. C09f *1/04*

U.S. Cl. 260—97.5 **6 Claims**

This invention is concerned with compounds that may be used as additives in synthetic lubricants. The compounds are formed from an amide of benzoic acid or a substituted benzoic acid and aminoguanidine bicarbonate, and a salt-forming aliphatic or aromatic carboxylic acid having from about 6 to 40 carbon atoms.

3,749,703

ASN^{15}-BOVINE THYROCALCITONIN

Stephen Guttmann, Allschwil, Edmond Sandrin and Janos Pless, Basel, and Hans Willems, Allschwil, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed Jan. 23, 1970, Ser. No. 5,358

Claims priority, application Switzerland, Jan. 31, 1969, 1,508/69; Apr. 17, 1969, 5,814/69

Int. Cl. C07c *103/52*; C07g *7/00*

U.S. Cl. 260—112.5 **1 Claim**

The invention concerns the novel polypepetide of the formula:

H—Cys-Ser-Asn-Leu-Ser-Thr-Cys-Val-Leu-Ser-Aln-Tyr-Trp-Lys-Asn-Leu-Asn-Asn-Tyr-His-Arg-Phe-Ser-Gly-Met-Gly-Phe-Gly-Pro-Glu-Thr-Pro-NH_2

The polypeptide is useful in lowering the calcium content in plasma.

3,749,704

N-(ω-AMINO LOWER ALKYL)-AMIDES OF 1,17-MODIFIED ACTH PEPTIDES

Rolf Geiger, Frankfurt am Main, and Hans-Georg Schröder, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,216

Claims priority, application Germany, Oct. 31, 1969, P 19 54 794.5

Int. Cl. C07c *103/52*; C07g *7/00*; C08h *1/00*

U.S. Cl. 260—112.5 **1 Claim**

Biologically-active ACTH peptide amides modified in the 1-position by β-alanyl, γ-aminobutyryl, D-seryl, β-hydroxypropionyl, or n-alkoxycarbonyl, and in the 17-position by lysine or ornithine, the amide group thereof further having an N-(ω-amino lower alkyl) substituent.

3,749,705

1,6-AMINOSUBERIC ACID ANALOGUE OF 7-GLYCINE-OXYTOCIN

Shumpei Sakakibara, Osaka, and Tsutomu Yamanaka, Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,480

Claims priority, application Japan, Nov. 17, 1969, 44/92,327

Int. Cl. C07c *103/52*; C07g *7/00*; C08h *1/00*

U.S. Cl. 260—112.5 **1 Claim**

A cyclic polypeptide of the formula:

Tyr-Ile-Gln-Asn-Asu-Gly-Leu-Gly-NH_2

wherein Tyr, Ile, Gln, Asn, Asu, Gly and Leu are residues of L-tyrosine, L-isoleucine, L-glutamine, L-asparagine, L-α-aminosuberic acid, glycine and L-leucine, respectively, and process for preparing same. The cyclic polypeptide is useful as a lactagogue and stimulant of uterine contraction.

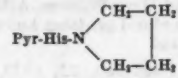
3,749,706

NOVEL DIPEPTIDE AMIDE AND PROCESS FOR ITS MANUFACTURE

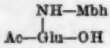
Rolf Geiger, Frankfurt am Main, Hans Wissmann, Bad Soden, Taunus, and Wolfgang König, Langenhain, Taunus, Germany, and Genevieve Azadian nee Boulanger, Paris, France, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,193
Claims priority, application Germany, Apr. 9, 1970, P 20 16 970.4
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 5 Claims

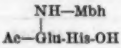
A dipeptide amide of the Formula I



in which Pyr is L-pyroglutamyl and His is L-histidyl is prepared by condensing L-pyroglutamic acid or a glutamic acid derivative of the general formula



in which Ac stands for the tertiary-butyloxy-carbonyl, benzyloxy-carbonyl, adamantyloxy-carbonyl or isobornyl-oxycarbonyl radical and Mbh stands for the 4,4'-dimethoxybenzhydryl group, with L-histidine-pyrrolidide or reacting the dipeptide of the general formula



in which Ac and Mbh have the meanings given above, with pyrrolidine with the aid of dicyclohexyl-carbodiimide in the presence of N-hydroxy-succinimide, 1-hydroxy-benzotriazole or 3-hydroxy-4-oxo-3,4-dihydro-1,2,3-benzotriazine, and converting the reaction product into the dipeptide amide of the Formula I by boiling in trifluoroacetic acid. The compound has an effect on the thyrotropine release of the pituitary gland.

3,749,707

PREPARATION OF NEW PROTEIN DERIVATIVES BY REACTING GELATIN WITH AROMATIC COMPOUNDS CONTAINING STILBENE OR DIPHENYLIMIDAZOLONE GROUPS

Marcel Nicolas Vrancken, Hove, and Jozef Frans Willems, Wilrijk-Antwerp, Belgium, assignors to Gevaert Photo-Producten N.V., Mortsel, Belgium

No Drawing. Continuation of application Ser. No. 576,567, Sept. 1, 1966, which is a continuation-in-part of application Ser. No. 175,818, Feb. 26, 1962, both now abandoned. This application Mar. 9, 1971, Ser. No. 122,530
Claims priority, application Netherlands, Feb. 27, 1961, 261,706
Int. Cl. C07g *7/00;* C08h *1/06;* G03c *1/92*
U.S. Cl. 260—117 1 Claim

A protein such as gelatin, casein or wool is chemically reacted at a pH between 7 and 11 with an organic aromatic fluorescent compound of the type containing a stilbene or diphenylimidazolone group and bearing a group which is chemically reactive with said protein, such as an active halogen atom, anhydride group or the like, the fluorescent compound being present in an amount equal to 20–120% by weight of the protein. The fluorescent compound is preferably dissolved in a solvent inert with respect to it and the protein at a concentration of 2–23%. The protein can be treated in the form of a solid or water solution, and in the latter case is recovered by reducing the pH of the solution. A preferred utility for the resultant reaction product is in the formation of layers in photographic material.

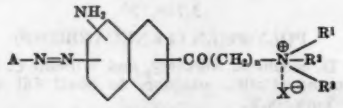
3,749,708

WATER-SOLUBLE BASIC HETEROCYCLIC AZO AMINONAPHTHYL DYESTUFFS CONTAINING A QUATERNARY AMMONIUM ALKANOYL SUBSTITUENT

Gert Hegar, Schoenenbuch, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 605,609, Dec. 29, 1966. This application Mar. 24, 1971, Ser. No. 127,769
Int. Cl. C09b *29/06;* D06p *3/76*
U.S. Cl. 260—156 2 Claims

Water-soluble basic azo-dyestuffs containing an ammonium-alkanoyl radical bound to an aminonaphthalene coupling component and having the formula



The compounds are suitable for dyeing polyacrylonitrile and polyvinylidene cyanide, the fibers so dyed having very good fastness to light.

3,749,709

PROCESS FOR THE PURIFICATION OF REDUCED PYRIDINE COENZYMES

Michael Nelboeck-Hochstetter and Klaus Beaucamp, Tutzing, Upper Bavaria, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Mar. 11, 1969, Ser. No. 806,239
Claims priority, application Germany, Mar. 20, 1968, P 17 67 010.9
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R 10 Claims

Process for the chromatographic purification of reduced pyridine coenzymes which comprises utilizing columns charged with weakly basic anion exchange resins which are not present in the hydroxyl form and carrying out the elution with an alkaline elution agent having a pH greater than 7.5.

3,749,710

METHOD FOR PREPARING HYDROXYETHYL-HYDROXYBUTYL CELLULOSE

Shunichi Koyanagi, Kinya Ogawa, Yoshiro Onda, Akira Yamamoto, and Hiroshi Suzuki, Naoetsu, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

No Drawing. Filed Apr. 13, 1971, Ser. No. 133,753
Claims priority, application Japan, Apr. 27, 1970, 45/36,034
Int. Cl. C08b *11/08*
U.S. Cl. 260—231 A 8 Claims

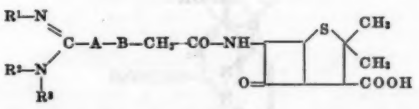
Cellulose material is reacted with ethylene oxide and butylene oxide in the presence of alkali and water. The hydroxyethylhydroxybutyl cellulose thus obtained is a novel substance which is soluble in cold water and in various polar organic solvents but insoluble in hot water, and superior in compatibility with salts, so that it is useful as a coating material, binder, paint remover, base for paints, emulsifier or polymerizing additive for synthetic resins, thickener and adhesive for ceramics and building boards.

3,749,711
ACYLAMINOPENICILLANIC ACIDS AND SALTS THEREOF

Manfred Schorr, Frankfurt am Main, and Elmar Schrinner, Wiesbaden, Germany, and Eberhard Schutze, Vienna, Austria, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 18, 1970, Ser. No. 73,647
Claims priority, application Germany, Sept. 27, 1969, P 19 49 021.2, P 19 49 022.3
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 9 Claims

Antibiotically active acylaminopenicillanic acids of the General Formula I



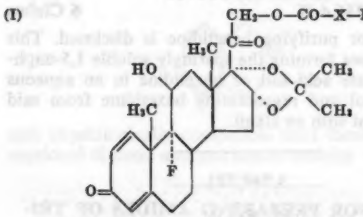
in which R^1, R^2 and R^3 represent hydrogen or lower alkyl groups, R^1 and R^2 may form together an alkylene group which may be substituted, A represents a phenylene or thienylene group which may be substituted and B represents oxygen or a chemical bond, and the physiologically tolerated salts thereof, pharmaceutical preparations containing these compounds and process for the preparation of such compounds and preparations.

3,749,712
TRIAMCINOLONE ACETONIDE ESTERS AND PROCESS FOR THEIR PREPARATION

Claudio Cavazza, Giancarlo Eletti Bianchi, and Enrico Diamanti, Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,671
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 1 Claim

New triamcinolone acetonide esters of the general formula



are prepared by a process wherein triamcinolone is reacted with an acyl chloride of the formula

R—NH—X—COCl

3,749,713
NOVEL AZIDE COMPOUNDS

Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,033
Int. Cl. C07c *117/00*
U.S. Cl. 260—240 R 3 Claims

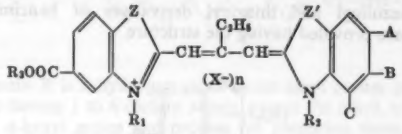
The novel compounds 2,6-bis(p - azidobenzylidene)-4-hydroxycyclohexanone and 2,6-bis(p - azidocinnamylidene)-4-hydroxycyclohexanone have been prepared. They have been found to exhibit unexpected advantages as sensitizers in negative photoresists.

3,749,714
NOVEL ASYMMETRIC CARBOCYANINE DYES

Akira Sato, Tadashi Ikeda, Yoshiyuki Nakazawa, Yashuharu Nakamura, and Haruo Takei, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed May 27, 1970, Ser. No. 41,115
Claims priority, application Japan, May 28, 1969, 44/41,466
Int. Cl. C09b *23/06*
U.S. Cl. 260—240.6 1 Claim

A silver halide emulsion, containing a sensitizing dye having the general formula



wherein R_1, R_2, R_3, A, B, C, Z, Z', X and *n* are described hereinafter, having increased red sensitivity is disclosed.

3,749,715
METHOD OF PREPARING 2,3-DIHYDRO-1H-PYRIDO-[2,3-b][1,4]-THIAZIN-2-ONES

Robert George Stein, Kenosha, Wis., and Carl William Nordeen, McHenry, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,206
Int. Cl. C07c *93/12*
U.S. Cl. 260—243 R 3 Claims

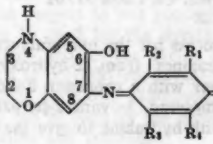
An improved method of preparing 2,3-dihydro - 1H-pyrido-[2,3-b][1,4]thiazin - 2 - ones by reacting an appropriate 2-mercapto - 3 - nitropyridine with an appropriately substituted haloacetic acid moiety.

3,749,716
N-[7-(6 - HYDROXY-1-OXA-4-AZA - 1,2,3,4-TETRAHYDRO)NAPHTHYL]BENZOQUINONEDIIMINES

Gregoire Kalopissis, 64 Rue Vauvenargues, Paris, France; Andree Bugaut, 7 Rue des Abondances, Boulogne-sur-Seine, France; and Francoise Estradier, 4 Rue Nobel, Paris, France

No Drawing. Original application July 6, 1970, Ser. No. 52,739. Divided and this application Apr. 19, 1972, Ser. No. 245,661
Claims priority, application Luxembourg, July 17, 1969, 59,119
Int. Cl. C07d *87/48*
U.S. Cl. 260—244 R 2 Claims

Indamines having the formula



wherein R_1, R_2, R_3 and R_4 can be hydrogen, halogen, lower alkyl or lower alkoxy and are usefully employed in a dye composition for coloring keratinous fibers. Such compositions are aqueous solutions of the indamines and can be formulated with lower alkanols and film-forming cosmetic resins to produce hair setting lotions.

3,749,717

THIAZOLINYL AND THIAZINYL DERIVATIVES OF BENZIMIDAZOLES

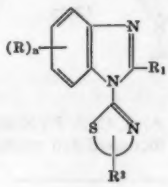
Rudiger D. Haugwitz, Highland Park, and Barbara V. Maurer and Venkatachala L. Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed May 4, 1971, Ser. No. 140,280

Int. Cl. C07d *93/00*

U.S. Cl. 260—243 R 10 Claims

Thiazolinyl and thiazinyl derivatives of benzimidazoles are provided having the structure



and which are useful as anthelmintic agents and anti-inflammatory agents.

3,749,718

4-(DICHLOROMETHYL)CINNOLINE AND PROCESS

David Edgar Ailman, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 7, 1971, Ser. No. 141,443

Int. Cl. C07d *51/08*

U.S. Cl. 260—250 A 4 Claims

A novel herbicidal compound, 4-(dichloromethyl)cinnoline, herbicidal compositions employing 4-(dichloromethyl)cinnoline, herbicidal methods and a novel method for the synthesis of 4-(dichloromethyl)cinnoline from 4-methylcinnoline are disclosed.

3,749,719

PROCESS FOR AMINO-s-TRIAZOLO-[4,3-a]PYRAZINES

James Clark, Michael Edward McMenim, Francis Leslie Rose, and Alastair Graham Wylie, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 17, 1971, Ser. No. 172,607

Claims priority, application Great Britain, Mar. 4, 1971, 6,029/71

Int. Cl. C07d *57/02*

U.S. Cl. 260—250 R 5 Claims

An improved process for the manufacture of 3-amino-s-triazolo[4,3-a]pyrazines from 2-hydroxypyrazines by reaction of the latter with a cyanogen halide to produce a new class of compound, 1-cyano-2-pyrazinones, which are then reacted with hydrazine to give the desired products.

3,749,720

PYRIDAZINOTHIONOPHOSPHORIC (PHOSPHONIC) ACID ESTERS

Christa Fest, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, and Günter Unterstenhöfer, Opladen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

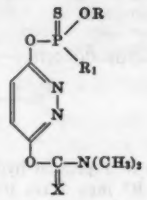
No Drawing. Filed Oct. 1, 1971, Ser. No. 185,808

Claims priority, application Germany, Oct. 10, 1970, P 20 49 813.9

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 9 Claims

Pyridazinothionophosphoric(phosphonic) acid esters of the general formula



(I)

in which

R is alkyl with 1–6 carbon atoms,

R_1 is alkyl or alkoxy with 1–6 carbon atoms or phenyl, and

X is oxygen or sulfur,

which possess insecticidal, acaricidal, nematocidal and rodenticidal properties.

3,749,721

PROCESS FOR THE PRODUCTION OF PURE HEXETIDINE

Wolfgang Herrmann and Gerhard Satzinger, Gundelfingen, Freiburg, Germany, assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,330

Claims priority, application Germany, Mar. 7, 1970, P 20 11 078.5

Int. Cl. C07d *51/18*

U.S. Cl. 260—256.4 H 6 Claims

A process for purifying hexetidine is disclosed. This process comprises forming the sparingly soluble 1,5-naphthalenedisulfonate acid salt of hexetidine in an aqueous aliphatic alcohol and regenerating hexetidine from said salt by treatment with an alkali.

3,749,722

METHOD FOR PREPARING AMIDES OF TRIMELLITIC ANHYDRIDE AND PRODUCT THEREFROM

Fred F. Holub, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 741,310, July 1, 1968, which is a division of application Ser. No. 638,636, May 15, 1967, now Patent No. 3,435,002. This application May 25, 1971, Ser. No. 146,792

Int. Cl. C07c *51/70*

U.S. Cl. 260—268 C 1 Claim

Amides of trimellitic anhydride can be prepared by reacting the latter directly with a disecondary amine at elevated temperatures and by a rearrangement reaction involving the elimination of water to obtain the amide dianhydride. Polyamide acid resins and polyamide imides can be prepared from such compositions.

3,749,723

CERTAIN BARBITURIC ACID DERIVATIVES

Andre Allais, Les Lilas, and Michel Peterfalvi, Paris, France, assignors to Roussel-UCLAF, Paris, France

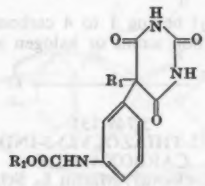
No Drawing. Filed Dec. 14, 1971, Ser. No. 207,953

Claims priority, application France, Dec. 22, 1970, 46,213

Int. Cl. C07d *51/20*

U.S. Cl. 260—256.4 C 3 Claims

Novel malonylureas of the formula



in which R_1 and R_2 are identical or different and represent an alkyl radical carrying from 1 to 6 carbon atoms, and their organic or mineral base salts, and their use as anti-convulsant agents.

3,749,724

CERTAIN 2-MERCAPTO-PYRIDO[2,3-d] PYRIMIDINE-4 (3H)-ONES

Fritz Wiedemann and Max Thiel, Mannheim, Kurt Stach, Mannheim-Waldhof, Egon Roesch, Lampertheim, and Klaus Hardebeck, Ludwigshafen (Rhine), Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

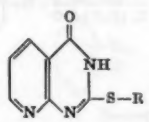
No Drawing. Filed Nov. 25, 1970, Ser. No. 92,935

Claims priority, application Germany, Dec. 11, 1969, P 19 62 057.6; July 21, 1970, P 20 36 063.8

Int. Cl. C07d *57/20*

U.S. Cl. 260—256.5 R 10 Claims

New 2 - mercapto-pyrido[2,3-d]pyrimidin-4(3H)-one compounds of the formula



and physiologically compatible salts thereof, possess exceptional diuretic and natriuretic activity.

3,749,725

SUBSTITUTED 3,3-DIPHENYLPIPERAZINES AND 3,3-DIPHENYLPIPERAZIN-2-ONES

Meier E. Freed, Paoli, and Scott J. Childress, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Dec. 23, 1968, Ser. No. 786,367, now Patent No. 3,631,047, dated Dec. 28, 1971. Divided and this application July 9, 1971, Ser. No. 161,322

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R 3 Claims

The disclosure is directed to substituted 3,3-diphenylpiperazines, substituted 3,3-diphenylpiperazin-2-ones and related compounds. The compounds are useful as sympathomimetic agents as evidenced by their production of mydriasis in standard laboratory animals.

3,749,726

LINEAR ALKYL-AMIDO TRANS-QUINACRIDONE PIGMENTS

Otto Fuchs, Frankfurt am Main, and Ernst Spietschka, Oberauroff, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

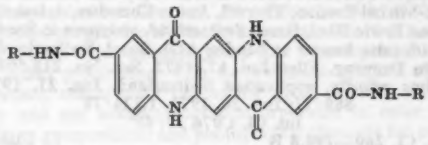
No Drawing. Filed Dec. 3, 1970, Ser. No. 94,962

Claims priority, application Germany, Dec. 4, 1969, P 19 60 896.9

Int. Cl. C07d *39/00*

U.S. Cl. 260—279 R 5 Claims

Linear trans-quinacridones of the general formula



wherein R is a hydrogen atom or an alkyl group, preferably having 1 to 6 carbon atoms, except the ethyl, n-butyl and n-hexyl group and process for preparing them. Said pigments are *at least as* fast to light and weathering and are suitable for coloring printing inks, lacquers and plastics.

3,749,727

BENZOXANTHENE DYESTUFFS AND PROCESS FOR THEIR MANUFACTURE

Otto Fuchs and Helmut Troster, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

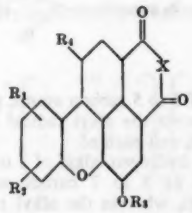
No Drawing. Filed Feb. 22, 1971, Ser. No. 117,713

Claims priority, application Germany, Feb. 24, 1970, P 20 08 491.7

Int. Cl. C07d *39/00*

U.S. Cl. 260—281 7 Claims

Benzoxanthene dyestuffs of the formula



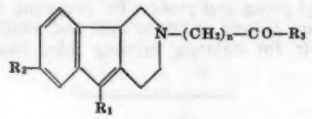
wherein X is hydrogen or a —N—R group, in which R is hydrogen, cycloalkyl, pyridyl, hydroxy, amino, aryl or substituted or unsubstituted alkyl, R_1 and R_2 are hydrogen, halogen, alkyl, alkoxy, aryl, carbalkoxy or cyano, R_3 is an alkyl group, which may be substituted and R_4 is hydrogen, nitro or an alkoxy group, which may be substituted. The dyestuffs, which have good fastness properties with respect to wet processing, thermofixation and light, can be used for the dyeing of synthetic polymers in the mass and for the dyeing of synthetic fibrous materials, such as polyethylene-glycol-terephthalate, polyamides or acetyl cellulose. Moreover, due to their fluorescence, they can be used for the preparation of daylight-fluorescent paints and coatings.

3,749,728
N-CYCLOALKYL AND N-CYCLOALKANE-ALKYLTHIOAMIDES
Bernard Loev, Broomall, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Filed Feb. 15, 1972, Ser. No. 226,531
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 E **5 Claims**

The compounds are N-cycloalkyl and N-cycloalkane-alkyl thioamides, for example N-cyclopropyl and N-cyclopropanemethyl 2-(2-pyridyl)thioacetamide, which are inhibitors of gastric acid secretion.

3,749,729
1,3,4,9b-TETRAHYDRO INDENO[1,2-c]PYRIDINES
Jean-Michel Bastian, Therwil, Anton Ebnother, Arlesheim, and Erwin Rissi, Basel, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland
No Drawing. Filed Jan. 17, 1972, Ser. No. 218,509
Claims priority, application Switzerland, Jan. 21, 1971, 889/71; Jan. 26, 1971, 1,121/71
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 B **16 Claims**

The invention concerns pharmaceutically acceptable acid addition salts of new compounds of Formula I,



(I)

wherein

R_1 is hydrogen or methyl,

R_2 is hydrogen, or, when R_1 is hydrogen, hydrogen, methyl or ethyl,

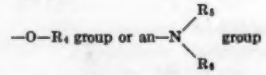
n is 2, or, when R_1 is methyl, 1, 2, 3 or 4, and

when R_1 is hydrogen,

R_3 is alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl, or phenyl mono- or disubstituted by fluorine, chlorine, bromine, methoxy or alkyl of 1 to 4 carbon atoms, or,

when R_1 is methyl,

R_3 is an



wherein

R_4 is alkyl of 1 to 5 carbon atoms, phenyl or phenylalkyl, wherein the alkyl radical is of 1 to 4 carbon atoms, and each of

R_5 and R_6 is hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl or phenylalkyl, wherein the alkyl radical is of 1 to 4 carbon atoms, or

R_5 and R_6 together with the nitrogen atom form a saturated 5- or 6-membered heterocyclic ring, the heterocycle being selected from heterocycles containing 1 nitrogen atom, 1 nitrogen atom and 1 oxygen atom, and 1 nitrogen atom and a further nitrogen atom substituted by an alkyl radical of 1 to 4 carbon atoms.

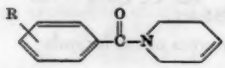
When R_1 is methyl, the compounds of Formula I can also be in free base form.

Processes for the production of said compounds as well as intermediates therefor are described.

The compounds are useful anti-aggressives and are furthermore useful in the treatment of excitation conditions, as indicated by their depressive effect on the central nervous system.

3,749,730
CERTAIN N-BENZOYL-1,2,5,6-TETRAHYDRO-PYRIDINES
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed Feb. 10, 1972, Ser. No. 225,272
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 R **5 Claims**

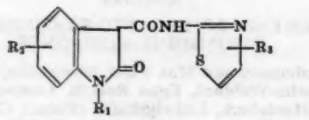
Compounds of the formula



wherein R is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halogen and their use as insect repellents.

3,749,731
2-OXO-N-(2-THIAZOLYL)-3-INDOLINE-CARBOXAMIDE
Harold Zinnes, Rockaway, Martin L. Schwartz, Gillette, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
No Drawing. Filed July 8, 1971, Ser. No. 160,904
Int. Cl. C07d *99/10*
U.S. Cl. 260—306.8 R **1 Claim**

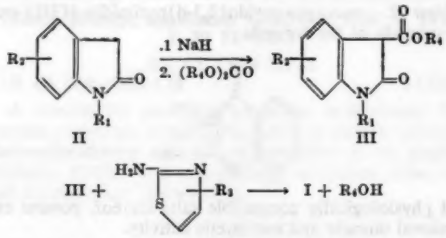
2-oxo-N-(2-thiazolyl)-3 - indolinecarboxamides having the following structural formula are discussed:



(I)

wherein R_1 is hydrogen, alkyl, aryl, or aralkyl; R_2 is hydrogen, alkyl, aralkyl, aryl, halogen, alkoxy, cyano, carbualkoxy, nitro, trifluoromethyl, and the like; R_3 is hydrogen or alkyl.

They are prepared in accordance with the following reaction schemes:



These compounds are useful as antipyretic, analgesic, and anti-inflammatory agents.

3,749,732
TRIAZOLYL KETONES
Jean Rody and Hanns Lind, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed Mar. 8, 1971, Ser. No. 122,132
Claims priority, application Switzerland, Mar. 11, 1970, 3,601/70
Int. Cl. C07d *55/02*
U.S. Cl. 260—308 A **8 Claims**

New 2 - phenyl-4-(2',4'-dihydroxybenzoyl)-v-triazoles and ethers and esters of the 4'-hydroxy group thereof are used as protective agents against light rays for light-sensitive organic materials. They are prepared by dealkylating the corresponding 2-phenyl-(2',4'-lower-alkoxybenzoyl)-v-triazoles and reacting the compounds obtained with alkylating agents or acylating agents.

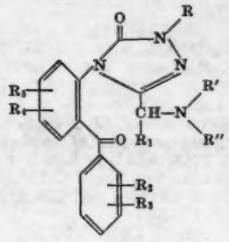
3,749,733

4 - (2 - BENZOYLPHENYL)-2,4-DIHYDRO-5[(ALKYLAMINO)ALKYL] - 3H - 1,2,4 - TRIAZOL-3-ONES AND PROCESS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

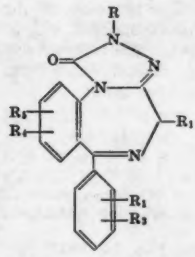
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,816
Int. Cl. C07d 55/06
U.S. Cl. 260—308 C 7 Claims

A 4 - (2 - benzoylphenyl) - 2,4 - dihydro - 5 - [(alkylamino) - alkyl] - 3H - 1,2,4 - triazol-3-one of the formula



(IV)

wherein R, R', and R_1 are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl defined as above, fluoro, chloro, bromo, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, and alkylsulfonyl in which the carbon moieties are of 1 to 3 carbon atoms, inclusive, and dialkylamino in which alkyl is defined as above; and wherein R'' is alkyl defined as above, is prepared by treating a 2,4-dihydro-6-phenyl-1Hs - triazolo[4,3 - a][1,4]benzodiazepin - 1 - one of the Formula I:



(I)

wherein R, R_1, R_2, R_3, R_4, and R_5 are defined as above, with a trialkyloxonium fluoroborate $(R'')_3O^+BF^-$ in which R'' is defined as above and hydrolyzing the complex thus produced, with an aqueous base. The product (II) thus obtained can be alkylated to give compounds of Formula III.

The compounds of Formula IV (combination of II and III) and the pharmacologically acceptable acid addition salts thereof are useful sedatives and tranquilizers for mammals and birds.

3,749,734

1-CYANOBENZIMIDAZOLES

John Hannah, Matawan, Donald W. Graham, Mountainside, and Edward F. Rogers, Middletown, N.J., assignors to Merck & Co. Inc., Rahway, N.J.

No Drawing. Filed July 12, 1971, Ser. No. 161,971
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 5 Claims

1 - cyanobenzimidazole having a trifluoromethyl or cyano substituent at the 2-position and two, three or four chlorine substituents in the benzenoid moiety of the molecule are employed as anthelmintic agents and as ectoparasiticides.

3,749,735

4-IMIDO-SUBSTITUTED-1-HYDROXY-2-NAPHTHAMIDES

Anthony Loria, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 758,172, July 11, 1968, which is a division of application Ser. No. 504,994, Oct. 24, 1965, now Patent No. 3,458,315. This application Dec. 7, 1970, Ser. No. 95,913
Int. Cl. C07d 27/10, 27/52
U.S. Cl. 260—326 N 5 Claims

Two-equivalent couplers containing a 4-hydroxy-1-naphthyl group wherein the hydrogen atom in the 1-position of the said naphthyl group has been replaced with an imido group react with the oxidation product of an aromatic amino color developing agent to form a cyan dye and are advantageously incorporated in color developer compositions and photographic elements for color photography.

3,749,736

5-ETHERS OF 1,3-BENZOXATHIOL-2-ONE

John D. Diekman, Mountain View, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,803
Int. Cl. C07d 89/06
U.S. Cl. 260—327 M 17 Claims

Novel 5-substituted-1,3-benzoxathiol-2-one compounds prepared by the alkylation of 5-hydroxy-1,3-benzoxathiol-2-one useful for control of insects.

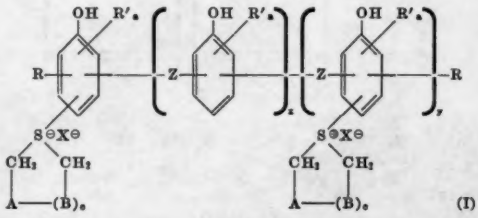
3,749,737

POLY(HYDROXYARYLPOLYMETHYLENESULFONIUM) ZWITTERIONIC MONOMERS AND SURFACE COATINGS THEREFROM

Melvin J. Hatch, Socorro, N. Mex., and Donald L. Schmidt and Hugh B. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 866,762, Oct. 15, 1969. This application Dec. 7, 1971, Ser. No. 205,754
Int. Cl. C07d 63/04, 65/04
U.S. Cl. 260—332.3 R 10 Claims

Poly(hydroxyarylpolymethylenesulfonium) salts of Formula I:



(I)

where Z is $—C(C_1–C_4 \text{ alkyl})_2—$ and $\Sigma(x+y)=1$, are prepared by condensation of a polynuclear phenol with a cyclic sulfide. These salts can be converted into a cyclic sulfonium hydroxide inner salt or zwitterionic monomer (II). These reactive cyclic sulfonium zwitterion monomers thermally polymerize to yield water-insoluble, thermoset resins useful as adhesives, coatings, films, and impregnants. Applied to nonporous surfaces, such as glass and wire, hard surface coatings with high impact resistance coupled with good water and chemical resistance are obtained.

3,749,738

POLY(HYDROXYARYLPOLYMETHYLENESULFONIUM) ZWITTERIONIC MONOMERS AND SURFACE COATINGS THEREFROM

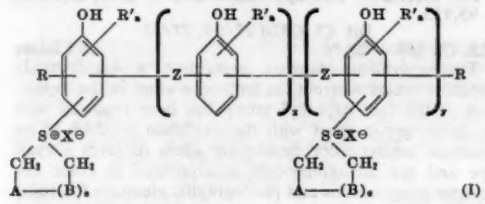
Melvin J. Hatch, Socorro, N. Mex., and Donald L. Schmidt and Hugh B. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 866,762, Oct. 15, 1969. This application Dec. 7, 1971, Ser. No. 205,755

Int. Cl. C07d *63/04, 65/04*

U.S. Cl. 260—332.3 R 10 Claims

Poly(hydroxyarylpolymethylenesulfonium) salts of Formula I:



(I)

where Z is $-CH_2-$ and $\Sigma(x+y)=1$–20, are prepared by condensation of a polynuclear phenol with a cyclic sulfide. These salts can be converted into a cyclic sulfonium hydroxide inner salt or zwitterionic monomer (II). These reactive cyclic sulfonium zwitterion monomers thermally polymerize to yield water-insoluble, thermoset resins useful as adhesives, coatings, films, and impregnants. Applied to nonporous surfaces, such as glass and wire, hard surface coatings with high impact resistance coupled with good water and chemical resistance are obtained.

3,749,739

POLY(HYDROXYARYLPOLYMETHYLENESULFONIUM) ZWITTERIONIC MONOMERS AND SURFACE COATINGS THEREFROM

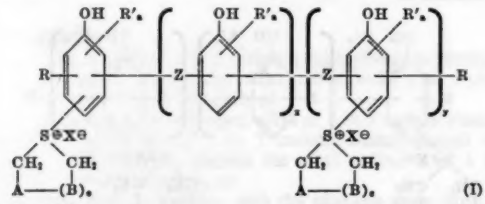
Melvin J. Hatch, Socorro, N. Mex., and Donald L. Schmidt and Hugh B. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Oct. 15, 1969, Ser. No. 866,762. Divided and this application Dec. 7, 1971, Ser. No. 205,756

Int. Cl. C07d *63/04, 65/04*

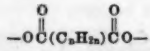
U.S. Cl. 260—332.2 A 10 Claims

Poly(hydroxyarylpolymethylenesulfonium) salts of Formula I:



(I)

where Z is



n is 0–6 and $\Sigma(x+y)=1$, are prepared by condensation of a polynuclear phenol with a cyclic sulfide. These salts can be converted into a cyclic sulfonium hydroxide inner salt or zwitterionic monomer (II). These reactive cyclic sulfonium zwitterion monomers thermally polymerize to yield water-insoluble, thermoset resins useful as adhesives, coatings, films, and impregnants. Applied to nonporous surfaces, such as glass and wire, hard surface coatings with high impact resistance coupled with good water and chemical resistance are obtained.

3,749,740

α,β-UNSATURATED ESTERS OF VULPINIC ACID

Blaine M. Sutton, Hatboro, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 150,209, June 4, 1971. This application July 28, 1972, Ser. No. 276,020

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.6 11 Claims

α,β-Unsaturated esters of vulpinic acid having antiarthritic activity prepared by the acylation of the corresponding vulpinic acid with an active derivative of the appropriate carboxylic acid such as an acyl halide.

3,749,741

TETRAHYDROPYRANYL-DIHYDRO-PGE$_1$

Donald P. Strike, Rosemont, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Application Nov. 12, 1969, Ser. No. 876,116, which is a continuation-in-part of application Ser. No. 765,020, Oct. 4, 1968, which in turn is a continuation-in-part of application Ser. No. 702,185, Feb. 1, 1968, all now abandoned. Divided and this application Apr. 15, 1971, Ser. No. 134,467

Int. Cl. C07d *7/04*

U.S. Cl. 260—345.7 1 Claim

4,5-disubstituted - 3 - hydroxycyclopentanones (I) are prepared by hydrogenolyzing the corresponding 4,5-disubstituted-2,3-epoxycyclopentanone (IV) which in turn is provided by reacting the corresponding 4,5 - disubstituted-2-cyclopenten-1-one (III) with alkaline hydrogen peroxide. Compounds (III) are prepared by cyclizing the corresponding 2,3-disubstituted levulinaldehyde (II) with a base. The products of the process are biologically active, especially compound (I) substituted in the 4-position with 3′-hydroxyoctyl and in the 5-position with 6′-carboxyhexyl. This compound has prostaglandin-like activity, especially blood pressure lowering and bronchodilator activity, and is a totally-synthetic dihydroprostaglandin E_1(dihydro PGE_1). The processes of the invention may also be used to obtain compounds with prostaglandin-like activity from appropriately substituted naturally occurring cyclopentanones, e.g. those isolated from the Caribbean gorgonian, *Plexaura homomalla.*

3,749,742

15α,16α-METHYLENE STEROIDS AND PROCESSES FOR THEIR PRODUCTION AND USE

Rudolf Wiechert and Hermann Steinbeck, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

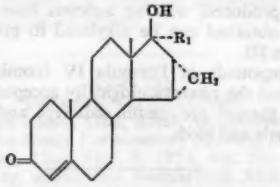
No Drawing. Filed Feb. 24, 1972, Ser. No. 229,205

Claims priority, application Germany, Feb. 24, 1971, P 21 09 555.6

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.4 15 Claims

15α,16α-methylene steroids of the formula



wherein R_1 is a hydrogen atom or saturated or unsaturated alkyl of 1–4 carbon atoms, and physiologically acceptable 17-esters thereof possess high androgenic activity with relatively low anabolic activity. They can be produced by oxidation of the corresponding Δ^4 and Δ^5-3-hydroxysteroids and by alkylation of the corresponding Δ^5-3-acyloxy-17-keto steroids followed by hydrolysis of the 3-acyloxy group and oxidation of the thus-produced 3-hydroxy group.

3,749,743
ALKYL-SUBSTITUTED MONOUNSATURATED KETO-ESTERS

John B. Siddall, Palo Alto, and Norman E. Liddell, Menlo Park, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Aug. 4, 1970, Ser. No. 61,397
Int. Cl. C11c 3/02
U.S. Cl. 260—410.9 13 Claims

Novel oxo-substituted aliphatic esters, derivatives thereof and intermediates therefor useful for the control of insects.

3,749,744
OXO-SUBSTITUTED α,β-UNSATURATED ALKYLATED FATTY ACIDS AND ESTERS

John B. Siddall and Clive A. Henrick, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,908
Int. Cl. C07c 59/32, 69/66; A01n 9/24
U.S. Cl. 260—410.9 R 8 Claims

Preparation of novel oxo-substituted α,β-unsaturated esters and derivatives thereof useful as lubricants, plasticizers and insect control agents.

3,749,745
OXIDATION PROCESS FOR THE PRODUCTION OF FATTY ACIDS

Karl P. Kammann, Jr., Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,133
Int. Cl. C08h 17/36
U.S. Cl. 260—413 4 Claims

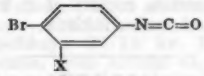
A process is provided whereby primary and secondary long-chain n-alkylbenzenes are oxidized in the presence of a catalyst at atmospheric pressure to produce fatty acids. The process gives an improved distribution of desirable high molecular weight fatty acids. When primary n-alkylbenzenes are used, the process is highly selective to acids of specific chain lengths to the near exclusion of low molecular weight, less desirable, fatty acids.

3,749,746
3-FLUORO-4-BROMO-PHENYLISOCYANATE

Dieter Duerr, Bottmingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 642,140, May 29, 1967. This application Aug. 12, 1970, Ser. No. 63,288
Int. Cl. C07c 119/04
U.S. Cl. 260—453 AR 1 Claim

The present invention relates to new isocyanates of the formula



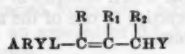
wherein X represents fluorine or chlorine; these new isocyanates of Formula I are valuable intermediates for the manufacture of herbicides.

3,749,747
SUBSTITUTED CINNANYL THIOCYANATES AND THEIR ISOMERS

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed May 12, 1970, Ser. No. 36,701
Int. Cl. C07c 161/02, 161/04
U.S. Cl. 260—454 4 Claims

Compounds corresponding to the formula



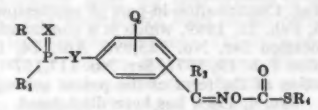
wherein ARYL is phenyl, substituted phenyl, naphthyl, and substituted naphthyl in which the substituents are halogen, nitro, and lower alkyl; R is independently hydrogen, or lower alkyl; R_1 is independently hydrogen, lower alkyl, or phenyl; R_2 is independently hydrogen, lower alkyl, and phenyl; with the provision that R, R_1, and R_2 are not simultaneously hydrogen when ARYL is phenyl; and Y is selected from the group consisting of —SCN and —NCS. The above-defined compounds are effective herbicides.

3,749,748
OXIME CARBAMATE PHOSPHATE, PHOSPHONATE, PHOSPHINATE AND PHOSPHOROAMIDATES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Division of application, Ser. No. 49,933, June 25, 1970, now Patent No. 3,652,737, which is a division of application Ser. No. 730,588, May 20, 1968, which in turn is a continuation-in-part of application Ser. No. 646,467, June 16, 1967, both now abandoned. This application Nov. 3, 1971, Ser. No. 198,013
Int. Cl. A01n 9/36; C07f 9/12, 9/18
U.S. Cl. 260—455 P 2 Claims

Oxime carbamate phosphates, phosphonates, phosphinates and phosphoroamidates having the general formula:



in which X and Y are independently selected from the group consisting of oxygen and sulfur; R is selected from the group lower alkyl or lower alkoxy, having from 1 to 6 carbon atoms inclusive; R_1 is selected from the group consisting of lower alkyl or lower alkoxy having from 1 to 6 carbon atoms, inclusive, amino, lower alkyl-substituted amino and phenyl; Q is selected from the group consisting of divalent tetramethylenediene-1,3, lower alkoxy or lower alkyl having from 1 to 4 carbon atoms inclusive, each, nitro, halogen and combinations thereof, and lower dialkyl-substituted thionophosphoryloxy; R_2 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, and phenyl; R_4 is lower alkyl having from 1 to 4 carbon atoms, inclusive, and β-chloro-loweralkyl having from 2 to 4 carbon atoms.

The compounds are useful as insecticides, animal contact and systemic parasiticides, herbicides and foliar fungi protectants.

3,749,749
PRODUCTION OF 2,2-DIALKYL-3-ACYLOXYPROPANALS

Franz Merger and Werner Fuchs, Ludwigshafen, and Toni Dockner, Meckenheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Rineland-Pfalz, Germany

No Drawing. Filed Jan. 5, 1971, Ser. No. 104,121
Claims priority, application Germany, Jan. 7, 1970, P 20 00 511.2
Int. Cl. C07c 69/74, 67/00, 69/02
U.S. Cl. 260—468 R 8 Claims

The production of 2,2-dialkyl-3-acyloxypropanals by acyloxymethylation of secondary aldehydes with carboxylic acids and formaldehyde in the presence of strong acids with simultaneous removal of water from the reaction mixture. The compounds prepared by the process according to the invention are valuable starting materials for the production of pesticides, polymers and dyes.

3,749,750

ALKYL ESTERS OF SUBSTITUTED PHENYL-SULFONYL ALKANOIC ACIDS

Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 25, 1971, Ser. No. 156,942
Int. Cl. C07c *147/06, 147/12*
U.S. Cl. 260—470 4 Claims

Novel 3-benzoyl-3-benzene sulfonyl alkanoic acids, alkyl esters are described which are useful as antitubercular agents.

3,749,751

REDUCING FREE FORMALDEHYDE CONTENT IN METHYLOLATED CARBAMATES

Panemangalore S. Pai, Charlotte, N.C., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,318
Int. Cl. C07c *125/04*
U.S. Cl. 260—482 C 10 Claims

The free formaldehyde content of methylolated carbamates is reduced by contacting an aqueous solution of the methylolated carbamate with a nitrogenous carbonyl compound having a CC(O)N(H) group, e.g., a pyrrolidone, in the presence of a caustic.

3,749,752

OLEFIN HYDROISOMERIZATION PROCESS

Ernest L. Pollitzer, Skokie, and Roy T. Mitsche, Island Lake, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 802,206, Feb. 25, 1969, which is a continuation-in-part of application Ser. No. 723,896, Apr. 24, 1968. This application Feb. 19, 1971, Ser. No. 117,157
The portion of the term of the patent subsequent to Jan. 4, 1989, has been disclaimed
Int. Cl. C07f *5/02*
U.S. Cl. 260—683.9 10 Claims

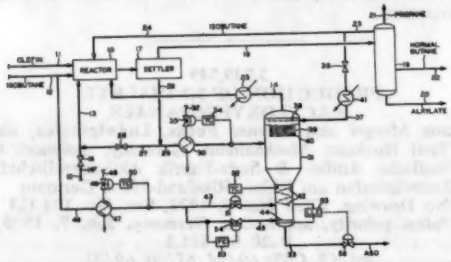
Olefinic hydrocarbons are hydroisomerized to a more branched chain paraffin by contacting the olefin, at hydroisomerization conditions, with a catalytic composite containing a platinum group component and a rhenium component combined with a carrier material containing alumina and finely-divided mordenite prepared by distributing the mordenite in an aluminum sol and gelling the resultant mixture.

3,749,753

PURIFICATION OF HF CATALYST IN ALKYLATION PROCESS

Frank W. Skraba, Old Ocean, Tex., assignor to Phillips Petroleum Company

Filed Apr. 15, 1971, Ser. No. 134,146
Int. Cl. C07c *3/12, 3/54*
U.S. Cl. 260—683.48 5 Claims



Olefins and isoparaffins are alkylated in the presence of an HF catalyst. The reactor effluent is passed to a settling zone. The hydrocarbon phase is fractionated to recover an alkylate product. The acid phase is recycled to the reactor. A portion of the recycled acid is passed to a purification column for removal of acid soluble oil. Stripping vapor is introduced into the purification column both above and below the surface of said soluble oil accumulated therein.

3,749,754

HYDROISOMERIZATION PROCESS WITH HYDROGEN FAUJASITE CONTAINING A GROUP VIII METAL

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Esso Research and Engineering Company

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,324
Int. Cl. C07c *5/30*
U.S. Cl. 260—683.68 14 Claims

An improved process for hydroisomerizing n-paraffins is provided comprising subjecting n-paraffins to hydroisomerization conditions in the presence of hydrogen and a hydroisomerization catalyst comprising a crystalline alumino-silicate zeolite composited with a Group VIII metal, said catalyst having been pretreated and/or continuously treated with an organo halogen compound or a hydrogen halide, and recovering the resulting iso-paraffin.

3,749,755

THERMOPLASTIC MOLDING COMPOSITIONS OF HIGH IMPACT RESISTANCE

Klaus Bronstert, Carlsberg, Franz Schmidt, Mannheim, and Wilhelm Schuette, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,895
Claims priority, application Germany, Dec. 22, 1969, P 19 64 156.6
Int. Cl. C08f *19/08, 19/10*
U.S. Cl. 260—876 R 2 Claims

Thermoplastic molding compositions of improved impact resistance and based on a mixture of an oxymethylene polymer and an elastomeric graft copolymer.

3,749,756

PREPARATION METHOD OF CARBOXYLATED POLYMER

Yujiro Kosaka, Masaru Uemura, and Tokio Fujiki, Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Shin Nanyo-shi, Yamaguchi, Japan

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,616
Claims priority, application Japan, Aug. 6, 1971, 46/58,973
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 R 7 Claims

A carboxylated polymer is produced by copolymerizing 5–80 parts by weight of a monomeric mixture of maleic anhydride and an alkyl acrylate, in contact with 95–20 parts by weight, of an ethylene-vinyl acetate copolymer having a vinyl acetate content of at least 5%, using a free radical polymerization initiator.

3,749,757

SILOXANE MODIFIED POLYESTER FIBER CONTAINING ELASTOMER

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

No Drawing. Continuation-in-part of application Ser. No. 32,431, Apr. 27, 1970, now Patent No. 3,674,724, dated July 4, 1972. This application Mar. 29, 1971, Ser. No. 129,209
Int. Cl. C08g *17/14, 39/10, 47/10*
U.S. Cl. 260—824 4 Claims

This invention is addressed to improved polyesters which are particularly well suited for use as reinforcements for elastomeric material in the manufacture of polyester fiber-reinforced elastomeric products in which the polyester is formed of a polycarboxylic acid, a polyol and a polysiloxane which contains at least one functional group which is reactive to one of the acid or polyol monomeric components.

3,749,758

POLYESTERS DERIVED FROM DIMETHYLOL PROPIONIC ACID IN ADMIXTURE WITH POLYEPOXIDES

John Allister Gannon, Toms River, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,386
Int. Cl. C08g *45/14*
U.S. Cl. 260—835 6 Claims

Compositions comprising carboxyl containing polyesters and di- or polyepoxides. The compositions when cured exhibit excellent adhesion to untreated and treated substrates, excellent flexibility and good resistance to chemical attack.

ERRATUM

For Class 423—278 see:
Patent No. 3,749,792

3,749,759

READILY-SOLUBLE, SOLID, WATER-CONTAINING ALKALI METAL SILICATES AND PROCESS

Helmut V. Freyhold, 2 Salierplatz, 4000 Dusseldorf-Oberkassel, Germany, and Volker Wehle, 57 Beethovenstrasse, 4010 Hilden, Germany

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,791
Claims priority, application Germany, Apr. 29, 1970, P 20 21 004.2
Int. Cl. C01b *33/32*; C11d *3/08*
U.S. Cl. 423—332 10 Claims

Readily-soluble, solid, water-containing alkali metal silicates selected from the group consisting of sodium silicate and potassium silicate, having a SiO_2 to alkali metal oxide ratio of from 2 to 4:1 and containing from 50% to 70% by weight SiO_2, 11 to 20% by weight of water and 0.2% to 10% by weight of water-soluble quaternary nitrogen compounds having from 4 to 24 carbon atoms per nitrogen atom, as well as the process of preparing said readily-soluble, solid, water-containing alkali metal silicates by adding from 0.1% to 5% by weight of said water-soluble quaternary nitrogen compounds to an aqueous alkali metal silicate solution containing from 20% to 37% by weight of SiO_2 and drying the resultant solution to a water content of from 11% to 20% by weight.

3,749,760

METHOD OF PRODUCING DIAMONDS

Boris Vladimirovich Deryagin, ulitsa Vavilova 37a, kv. 54, Moscow, U.S.S.R.; Valentin Nikolaevich Bakul, ulitsa Kirova 34a, kv. 12, Kiev, U.S.S.R.; Dmitry Valerianovich Fedoseev, ulitsa akademika Pavlova 40, kv. 140, Moscow, U.S.S.R.; Jury Ivanovich Nikitin, ulitsa Krasnopolskaya 11/13, kv. 14; and Anatoly Vasilievich Bochko, ulitsa Artema 42, kv. 12, both of Kiev, U.S.S.R.; and Vadim Alexandrovich Ryabov, Pushkinskaya ulitsa 7/5, kv. 37; and Valentin Pavlovich Varnin, Orlikov pereulok 6/1, kv. 57, both of Moscow, U.S.S.R.

No Drawing. Filed Feb. 18, 1971, Ser. No. 116,611
Claims priority, application U.S.S.R., Apr. 24, 1970, 1,421,451
Int. Cl. C01b *31/06*
U.S. Cl. 423—446 1 Claim

Diamond is grown on diamond seeds by contacting the diamond seeds at a temperature of from about 600° C. to about 1600° C. and a pressure of from about 0.1 to about 75 mm. Hg with a carbon-containing compound in a mixture with oxygen taken in an amount which is not more than that required for oxidizing non-diamond carbon that is liberated in a simultaneous process of carbon deposition and diamond formation. Advantageously, the oxygen is taken in an amount of 0.1–5.0% of the total volume of the mixture.

3,749,761

PROCESS FOR THE RECOVERY OF MERCURY FROM AQUEOUS SOLUTION

Warren E. Dean and Charles M. Dorsett, New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Aug. 27, 1971, Ser. No. 175,710
Int. Cl. C01g *13/00*
U.S. Cl. 423—562 14 Claims

A process for removing mercury from solution and particularly from mercury electrolytic cell effluent is provided. The process comprises intermixing with said solution a sulfur compound in an amount sufficient to provide sulfide ion to react with the mercury and other ions present therein which react with sulfide ion and treating the resultant solution with an adsorbent, preferably activated carbon, to remove the soluble mercury.

3,749,762

PROCESS FOR PRODUCING SULFUR FROM SOUR GAS

Neal R. Montgomery, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Aug. 2, 1971, Ser. No. 168,304
Int. Cl. C01b *17/04*
U.S. Cl. 423—574 5 Claims

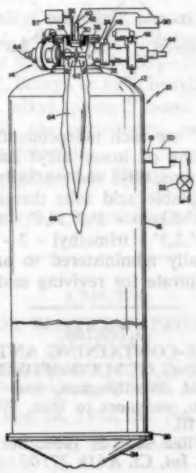
This invention provides a process for recovering sulfur from sour gases taking advantage of the increased recovery obtained by the use of low temperature reactors. In a three-reactor plant the feed stream is alternately fed in clockwise sequence to each of the three reactors under low temperature conditions. The cycle of operation for each reactor follows the sequence: Claus reaction, cooling, cleanup and regeneration. By this procedure, recoveries in excess of 99 percent are possible.

3,749,763

PROCESSING OF SILICATE ORES AND PRODUCT THEREOF

Lawrence W. Scammon, Jr., Concord, Clarence L. Grant, Durham, and Philip H. Wilks, Manchester, N.H., assignors to Humphreys Corporation, Bow, N.H.

Filed Aug. 3, 1971, Ser. No. 168,687
Int. Cl. C01g *25/02*
U.S. Cl. 423—608 32 Claims



Separating silica from a metal silicate ore such as zircon by heating particles of the ore above the dissociation temperature of the ore without coalescence of the

particles, and quenching the heated particles immediately so that the particle temperature decreases from above to below the dissociation temperature in less than 0.1 second. Dissociated zircon particles produced by this process have extremely small zirconia crystallites having dimensions less than about 0.2 micron in fused amorphous silica. Zirconia is produced from these dissociated zircon particles by leaching in an aqueous alkali medium.

3,749,764

TITANIUM DIOXIDE PIGMENT

Max G. Basque, Pittsburg, James E. Magner, Antioch, Joseph P. Surls, Walnut Creek, and Ben F. West, Orinda, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 18, 1971, Ser. No. 189,827
Int. Cl. C01g *23/04*
U.S. Cl. 423—610 **5 Claims**

Elongate monocrystalline rutile nucleus crystals are mixed with an acidic titanium chloride solution which contains from 0.1 to 60 grams of dissolved titanium per liter, from 0.004 to 9 gram ions of chloride per liter and little or no phosphate, sulphate or bisulphate. The mixture is heated at a temperature of from 80° to 150° C., thereby producing composite titanium dioxide pigment particles consisting each of one or more nucleus crystals surrounded by elongate rutile crystallites in generally parallel array together with interstitial non-rutile titanium dioxide. The pigment particles have aspect ratios of from 3 to 150, effective diameters of from 0.05 to 0.3 micron and contain not more than about ten weight percent of the non-rutile titanium dioxide.

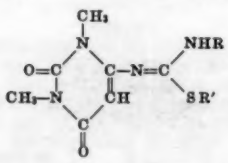
3,749,765

METHODS OF ANTAGONIZING BARBITURATES WITH URACIL THIOPSEUDOUREAS

Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Original application Aug. 13, 1969, Ser. No. 849,891, now Patent No. 3,637,703. Divided and this application June 15, 1971, Ser. No. 153,439
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 **1 Claim**

Uracil thiopseudoureas having the general formula



wherein R and R′ are each independently selected from the group consisting of lower alkyl having from 1 to about 3 carbon atoms, allyl and methallyl, and the pharmaceutically acceptable acid salts thereof, for example, 1-allyl - 3 - (2′,4′-diketo - 1′,2′,3′,4′ - tetrahydropyrimidin - 6 - yl) - 1′,2,3′ - trimethyl - 2 - thiopseudourea, are pharmaceutically administered to animals given an overdose of barbiturate for reviving said animals.

3,749,766

ALDEHYDE-CONTAINING ANTI-CARIES CHEWING GUM COMPOSITIONS

John H. Litchfield, Worthington, and Victor G. Vely, Columbus, Ohio, assignors to Wm. Wrigley, Jr. Company, Chicago, Ill.

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,770
Int. Cl. A61k *27/00*
U.S. Cl. 424—48 **14 Claims**

Unique chewing gum compositions possessing anti-caries activity characteristics comprising a chewing gum base having incorporated therein at least one anti-microbial agent comprising a monoaldehyde containing at least six carbon atoms. The chewing gum compositions can and preferably do contain conventional adhesive as well as conventional flavoring agents.

3,749,767

ORAL PREPARATION CONTAINING UNSYMMETRICAL OLIGOQUATERNARY AMMONIUM COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 716,412, Mar. 27, 1968, and Ser. No. 82,594, Oct. 21, 1970, both abandoned. This application Sept. 30, 1971, Ser. No. 185,444
Int. Cl. A61k *7/16*
U.S. Cl. 424—54 **7 Claims**

Unsymmetrical oligoquaternary ammonium compounds containing at least two onium nitrogen atoms. Typical compounds are:

$$[C_{12}H_{25}N^{+}(Me)_2(CH_2)_4N^{+}(Me)_2CH_2C_6H_5]Br$$

$$[C_{14}H_{29}N^{+}(Me)_2(CH_2)_{10}N^{+}(Me)_2CH_2C_6H_4Cl]Br_2$$

and

$$[C_{12}H_{25}N^{+}(Me)_2(CH_2)_4N^{+}(Me)_2(CH_2)_2N^{+}(Me)_2CH_2C_6H_5]Br_3$$

These compounds are effective as antimicrobial agents and as anticaries or anticalculus agents.

3,749,768

ARTIFICIALLY COLORING THE SKIN WITH TETRAZOLIUM SALTS

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne, France, assignors to Societe Anonyme dite L'Oreal

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,085
Claims priority, application France, Mar. 14, 1968, 143,832
Int. Cl. A61l *23/00*
U.S. Cl. 424—59 **6 Claims**

An artificial skin-tanning lotion comprising at least one of certain tetrazolium salts, preferably in combination with a reducing agent.

3,749,769

NAIL LACQUER COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Iwakichi Sugiyama, Narashino, and Haruki Tomozuka, Tokyo, Japan, assignors to Matsumoto Chemical Industry Co., Ltd., Ichikawa-shi, Chiba-ken, Japan

No Drawing. Continuation of abandoned application Ser. No. 753,745, Aug. 19, 1968. This application Jan. 22, 1971, Ser. No. 108,971
Claims priority, application Japan, Feb. 1, 1968, 43/5,832
Int. Cl. A61k *7/04*
U.S. Cl. 424—61 **5 Claims**

A nail lacquer having a good water-proofness, adhesiveness and luster is obtained by polymerizing acrylic monomers in a solvent having a relatively large chain-transfer constant to form oligomers or co-oligomers, and blending the obtained oligomers or co-oligomers with a nitrocellulose lacquer in the amount of 30–65% based on the solid content of the nitrocellulose lacquer.

3,749,770

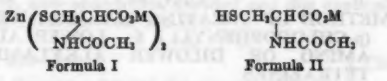
COMPOSITIONS CONTAINING ZINC MERCAPTIDE N-ACETYLCYSTEINE CARBOXYLATE SALTS

Tellis A. Martin, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

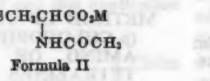
No Drawing. Original application Aug. 11, 1969, Ser. No. 849,150, now Patent No. 3,647,834, dated Mar. 7, 1972. Divided and this application July 21, 1971, Ser. No. 164,900
Int. Cl. A61k *27/00*
U.S. Cl. 424—72 **6 Claims**

Compositions containing from 2 to 10% by weight of a zinc mercaptide N-acetylcysteine carboxylate salt of

Formula I and from 90 to 98% by weight of an N-acetylcysteine carboxylate salt of Formula II are substantially odorless and have improved taste compared to the pure N-acetylcysteine carboxylate.



Formula I



Formula II

3,749,771

ANTIVIRAL TREATMENT

William Regelson, Richmond, Va., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Application July 10, 1970, Ser. No. 54,021, now Patent No. 3,624,218, which is a continuation-in-part of application Ser. No. 716,257, Mar. 6, 1968, which in turn is a continuation-in-part of application Ser. No. 577,675, Sept. 7, 1966, both now abandoned. Divided and this application Nov. 23, 1970, Ser. No. 92,276

Int. Cl. A61k *27/00*

U.S. Cl. 424—78 1 Claim

Certain water-soluble copolymers prepared from divinyl ether and maleic anhydride have been found to suppress foot-and-mouth disease virus growth in cloven-footed animals. Administration of said copolymers not only suppresses growth in infected animals but also increases resistance to virus infection in healthy animals by stimulating the production of interferon.

3,749,772

DERMAL PROTECTIVE FILM

Nathan F. Cardarelli, Copley, and Seymour Zachary Mansdorf, Akron, Ohio, assignors to The University of Akron, Akron, Ohio

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,412

Int. Cl. A61k *15/00*

U.S. Cl. 424—81 3 Claims

Composition of matter for preventing skin irritation from contact with "poison ivy." The composition is based upon a film-forming acrylic polymer and includes a linking agent so that upon application by a solvent carrier to the skin a selective membrane is formed. The composition may also include an oxidizing agent for breakdown of irritation causing allergens selectively retained by the membrane.

3,749,773

GELLED STEROID OINTMENT

Fred C. Ninger, Morristown, and Martin L. Eichman, Mendham, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,970

Int. Cl. A61k *17/00, 27/10;* A61l *23/00*

U.S. Cl. 424—81 3 Claims

The present invention relates to a topical ointment base especially suited to the incorporation of a suitable steroid. The ointment base of the present invention is a mixture of ethanol, propylene glycol and water having a topically active amount of betamethasone 17-benzoate dissolved therein and gelled with a neutralized carboxy vinyl polymer.

3,749,774

SECRETIN PREPARATION HAVING PROLONGED ACTION AND THE PROCEDURE OF MANUFACTURE

Rudolf Schleyerbach, Hofheim, Taunus, and Rolf Geiger, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Jan. 27, 1972, Ser. No. 221,414

Claims priority, application Germany, Jan. 30, 1971, P 21 04 344.7

Int. Cl. A61k *27/00*

U.S. Cl. 424—177 2 Claims

Secretin preparation having prolonged action which comprises a content of

(a) secretin

(b) an aqueous solution of gelatin-derivative cross-linked with hexamethylene-diisocyanate and

(c) polyphloretin phosphate and a process for the manufacture thereof.

3,749,775

INSECTICIDAL 2-AMINOTHIAZOLE PHOSPHATES AND PHOSPHONATES

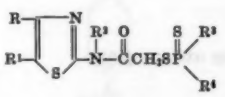
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company

No Drawing. Original application July 7, 1969, Ser. No. 839,626, now Patent No. 3,591,600. Divided and this application Jan. 28, 1971, Ser. No. 110,639

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 21 Claims

The use of compounds of the formula



in which

R is hydrogen; alkyl; naphthyl; phenyl; mono or di substituted phenyl wherein the substituents are halogen, nitro, alkyl; or the group $—CH_2—S—R^5$ in which R^5 is alkyl, phenyl, benzyl, or halophenyl;

R^1 is hydrogen; alkyl; phenyl; mono or di substituted phenyl wherein the substituents are halogen, nitro, alkyl; nitro; or halogen;

R^2 is hydrogen, alkyl; allyl or phenyl;

R^3 is alkoxy and

R^4 is alkoxy or alkyl as insecticides and acaricides.

3,749,776

METHOD FOR BLOCKING PROSTAGLANDIN ACTIVITY

Kenneth E. Eakins, Sparkill, N.Y., assignor to Allergan Pharmaceuticals, Inc., Santa Ana, Calif.

Filed Aug. 28, 1970, Ser. No. 67,919

Int. Cl. A61k *27/00*

U.S. Cl. 424—203 8 Claims

The disclosure describes a method of selectively blocking the actions of prostaglandins comprising administering of an effective amount of a polyheterocyclic phosphoric ester such as polyphloretin phosphate to the site of prostaglandin activity.

3,749,777

METHOD OF SUPPLYING PHOSPHATE EMPLOYING N-PHOSPHORYLAMINOETHYL PHOSPHATE

Perttu V. Lankso, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

No Drawing. Original application Aug. 15, 1969, Ser. No. 850,636, now Patent No. 3,697,626. Divided and this application Feb. 18, 1972, Ser. No. 227,595
Int. Cl. A61k *27/00*
U.S. Cl. 424—204 1 Claim

N-phosphorylaminoethyl phosphate is made from phosphoric acid and 2-aminoethanol. It is useful as a therapeutic agent for producing high absorption and retention of phosphate and calcium with extremely low renal calcinosis.

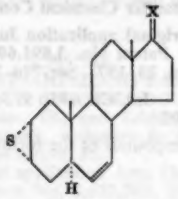
3,749,778

2,3-EPITHIO-5α-ANDROST-6-ENE COMPOUNDS

Taichiro Komeno, Osaka, Japan, assignor to Shionogi & Co., Ltd., Higashi-ku, Osaka, Japan

No Drawing. Application Dec. 24, 1969, Ser. No. 888,031, which is a continuation-in-part of abandoned application Ser. No. 769,412, Oct. 21, 1968. Divided and this application Aug. 30, 1971, Ser. No. 176,279
Claims priority, application Japan, Oct. 25, 1967, 42/68,682
Int. Cl. A61k *17/00*
U.S. Cl. 424—241 25 Claims

2α,3α - epithio - 17-oxygenated-5α-androst-6-ene compounds of the formula:



wherein X is an oxo group or a

group, in which R is a hydrogen atom or an optionally substituted lower hydrocarbon-carbonyl group or a substituted or unsubstituted cyclo-lower hydrocarbon group or tetrahydropyranyl group or tetrahydrofuranyl group; R' is a hydrogen atom or a lower hydrocarbon group, having strong antiestrogenic activity accompanied with least side effects, pharmaceutical preparation containing one or more of them and process for preparation of these compounds.

3,749,779

STABLE SOLUTIONS OF SODIUM DIPHENYLHYDANTOIN

George H. Schneller, Devon, Howard J. Levin, Norristown, and Stanley Sklar, Broomall, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Aug. 27, 1970, Ser. No. 67,558
Int. Cl. A61k *25/00*
U.S. Cl. 424—273 11 Claims

Disclosed are stable, optically clear, injectable solutions of sodium diphenylhydantoin in a stabilizing vehicle of: propylene glycol; propylene glycol (70.0–99.9%) and ethanol or glycerin (0.1–30.0%); and propylene glycol (80.0–99.9%), a mixture (0.1–20.0%) of ethanol or glycerin (50.0–99.9%) and water (0.1–50.0%). Also disclosed are the above solutions containing monoethanolamine (1.0–8.0%) which when added to dextrose-containing intravenous solutions provide relatively long term optical clarity.

3,749,780

METHOD OF TREATING MALARIA WITH 3-(p-CHLOROPHENYL) - 6 - LOWER ALKYLAMINO OR DILOWER ALKYLAMINO-s-TETRAZINES

Redginal Irving Hewitt, Spring Valley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 5, 1971, Ser. No. 131,411
Int. Cl. A61k *27/00*
U.S. Cl. 424—244 3 Claims

New compositions comprising 3-(p-chlorophenyl)-6-lower alkylamino or dilower alkylamino-s-tetrazines and a pharmaceutically acceptable carrier are described. A method of treating malaria with the compositions is also described.

3,749,781

PHARMACEUTICAL COMPOSITION AND METHOD OF TREATMENT

Lewis R. Mandel, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 80,176, Oct. 12, 1970. This application Feb. 4, 1972, Ser. No. 223,721
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 8 Claims

A composition for and a method of inhibiting indoleamine-N-methyl transferase comprising the administration to a host of a therapeutically effective amount of a compound selected from the group consisting of 2,3-dimercaptoquinoxaline, 2,3,4,6,7,8-hexahydropyrrolo[1,2-a] pyrimidine, mono-lower alkyl derivatives of 2,3,4,6,7,8-hexahydropyrrolo-[1,2-a]pyrimidine, quinuclidine, 1-pyrrolidinecarboxamidine, 3,4,6,7,8,9-hexahydro-2H-pyrido-[1,2 - a]pyrimidine, 2,3,4,6,7,8,9,10 - octahydropyrimido-[1,2-a]azepine, 1-methyl-2-trans-styryl-1,4,5,6-tetrahydropyrimidine, (2,4-dihydroxy-5-pyrimidyl)-disulfide, 2,3-dimethoxy-5-methyl-6-bromobenzoquinone and the pharmaceutically acceptable salts thereof.

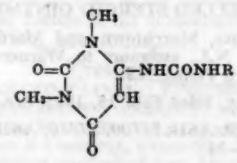
3,749,782

URACIL UREAS FOR REVIVING AN ANIMAL GIVEN AN OVERDOSE OF BARBITURATE

Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Original application Aug. 13, 1969, Ser. No. 849,889, now abandoned. Divided and this application Dec. 6, 1971, Ser. No. 205,306
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 1 Claim

Uracil ureas having the general formula



wherein R is selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, allyl, cyclohexyl and 2-methylphenyl, for example, 1 - (2,4 - diketo-1,3-dimethyl-1,2,3,4-tetrahydropyrimidin - 6 - yl) - 3 - ethylurea, are pharmaceutically administered to animals given an overdose of barbiturate for reviving said animals.

3,749,783

URACIL THIOUREAS FOR REVIVING AN ANIMAL GIVEN AN OVERDOSE OF BARBITURATE

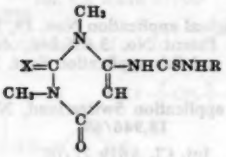
Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Original application Aug. 13, 1969, Ser. No. 849,890, now abandoned. Divided and this application Dec. 6, 1971, Ser. No. 205,281

Int. Cl. A61k 27/00

U.S. Cl. 424—251 1 Claim

Uracil thioureas having the general formula



wherein X is selected from the group consisting of O and S, and wherein R is selected from the group consisting of lower alkyl having from 1 to about 4 carbon atoms, allyl, methallyl and phenyl, for example, 1-(2,4-diketo-1,3 - dimethyl-1,2,3,4-tetrahydropyrimidin-6-yl)-3-methyl-2-thiourea, are pharmaceutically administered to animals given an overdose of barbiturate for reviving said animals.

3,749,784

PSORIASIS TREATMENT

Irving S. Johnson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 84,199, Oct. 26, 1970. This application May 3, 1972, Ser. No. 249,926

Int. Cl. A61k 27/00

U.S. Cl. 424—262 5 Claims

Psoriasis is treated topically, parenterally or orally with vincaleucoblastine (vinblastine, VLB) or leurocristine (vincristine).

3,749,785

PHARMACEUTICAL COMPOSITIONS CONTAINING A TRICYCLIC HETEROCYCLIC AMIDE OF A DIALLYLAMINO-ALKANOIC ACID

Günther Schmidt, Robert Engelhorn, and Matyas Leitold, Biberach-Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

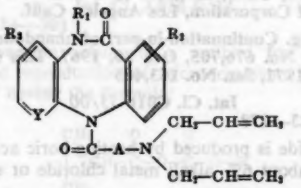
No Drawing. Original application July 13, 1970, Ser. No. 54,624, now Patent No. 3,691,159. Divided and this application Aug. 1, 1972, Ser. No. 277,096

Claims priority, application Germany, July 18, 1969, P 19 36 670.2

Int. Cl. A61k 27/00

U.S. Cl. 424—256 2 Claims

Stomach ulcer inhibiting and stomach juice secretion inhibiting pharmaceutical compositions containing as an active ingredient a compound of the formula



wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms,
R_2 and R_3 are each hydrogen or halogen,
Y is nitrogen or —CH—, and
A is alkylene of 1 to 2 carbon atoms,

and their non-toxic, pharmacologically acceptable acid addition salts; and a method of inhibiting the formation of stomach ulcers and inhibiting the secretion of stomach juice in warm-blooded animals.

3,749,786

ORGANIC COMPOUNDS IN TREATING ALLERGIC CONDITIONS

Jean-Pierre Bourquin, Magden/AG, Gustav Schwarb, Allschwil, and Erwin Waldvogel, Aesch, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

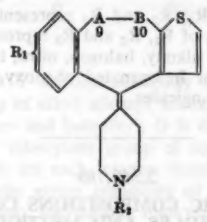
No Drawing. Continuation-in-part of application Ser. No. 120,738, Mar. 3, 1971, now Patent No. 3,682,930, dated Aug. 8, 1972. This application Aug. 7, 1972, Ser. No. 278,244

Claims priority, application Switzerland, Mar. 11, 1970, 3,598/70; July 31, 1970, 11,593/70

Int. Cl. A61k 27/00

U.S. Cl. 424—267 7 Claims

The present invention concerns a novel method of treating allergic conditions, which comprises administering an effective dose of a histaminolytic of the formula:



wherein R_1 is hydrogen, halogen or alkoxy of 1 to 4 carbon atoms, R_2 is alkyl of 1 to 4 carbon atoms, and —A—B— is —CH_2—CO— or —CO—CH_2, or a pharmaceutically acceptable acid addition salt thereof.

3,749,787

PHARMACEUTICAL COMPOSITIONS

Walter Hepworth and Gilbert Joseph Stacey, Macclesfield, Cheshire, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Sept. 23, 1966, Ser. No. 581,452, now Patent No. 3,538,107, dated Nov. 3, 1970. Divided and this application Aug. 5, 1970, Ser. No. 61,405

Claims priority, application Great Britain, Oct. 7, 1965, 42,635/65; Apr. 21, 1966, 17,496/66; June 16, 1966, 26,862/66

Int. Cl. A61k 27/00

U.S. Cl. 424—270 4 Claims

Substituted α-(phenyl-thiazolyl) acetic acid derivatives and α-(chlorobenzyl-thiazolyl) acetic acid derivatives, processes for preparing these compounds, and pharmaceutical compositions containing the same. The compounds exhibit anti-inflammatory, analgesic and anti-

pyretic activity, and they reduce the concentration of fibrinogen, cholesterol and/or triglycerides in blood.

3,749,788

MICROBICIDAL AND GERMICIDAL COMPOSITIONS CONTAINING N - HALOPHENYLDICHLOROISOTHIAZOLONES

Werner Toepel, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

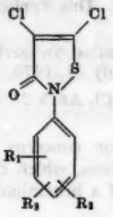
No Drawing. Original application July 1, 1969, Ser. No. 838,330, now Patent No. 3,635,997, dated Jan. 18, 1972. Divided and this application Nov. 1, 1971, Ser. No. 194,572

Claims priority, application Switzerland, July 5, 1968, 10,067/68

Int. Cl. A01n *9/12, 9/22*

U.S. Cl. 424—270 6 Claims

Isothiazolones of the general formula



in which one of R_1, R_2 and R_3 represents halogen and each of the others of R_1, R_2 and R_3 represents hydrogen, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl, cyano, phenoxy or halogenated phenoxy, are useful as bactericides and fungicides.

3,749,789

ANTHELMINTIC COMPOSITIONS CONTAINING BENZIMIDAZOLES AND METHOD OF USE

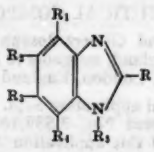
Michael H. Fisher, Somerville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,224

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 6 Claims

Substituted 2-trifluoromethyl and 2-pentafluoroethyl benzimidazoles of the formula:



wherein R is —CF_3 or —CF_2CF_3; R_1, R_2, R_3 and R_4 are H, F, Cl, Br or I, provided that only one of R_1, R_2, R_3 and R_4 is H; and R_5 is H, loweralkyl, loweralkenyl, loweralkoxyloweralkyl, carboxyloweralkyl and loweralkylesters thereof, loweralkanoyl or aminoloweralkanoyl and the N-loweralkyl and N,N-diloweralkyl derivatives thereof; and alkali metal and alkaline earth metal and pharmaceutically acceptable amine salts thereof when R_5 is hydrogen or carboxyloweralkyl, and salts thereof with pharmaceutically acceptable acids when R_5 is aminoloweralkyl, are employed as the essential active ingredient in anthelmintic formulations and feed stuffs intended for the treatment and control of helminthiasis in animals.

3,749,790

DERIVATIVES OF DIBENZO[b,f]PYRROLO-[3,4-d]AZEPINE IN COMPOSITIONS AND A METHOD FOR PRODUCING A C.N.S. DEPRESSANT EFFECT

Hans Blattner and Walter Schindler, Riehen, near Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Nov. 19, 1969, Ser. No. 878,177, now Patent No. 3,636,046, dated Jan. 18, 1972. Divided and this application Sept. 22, 1971, Ser. No. 182,868

Claims priority, application Switzerland, Nov. 12, 1969, 18,946/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 6 Claims

Compounds of the class of 1,2,3,8-tetrahydro-dibenzo-[b,f]pyrrolo[3,4-d]azepines and pharmaceutically acceptable acid addition salts thereof have a depressant effect on the central nervous system; they can be prepared from N-substituted 10,11-bis-bromomethyl-5H - dibenz[b,f]azepines and a primary amine; the compounds are active ingredients of pharmaceutical composition; an illustrative embodiment is 2-ethyl-1,2,3,8-tetrahydro-dibenzo[3,4-d] azepine.

3,749,791

FLUORINE OR CHLORINE-SUBSTITUTED 2,2-BIS(TRIFLUOROMETHYL) - 1,3 - DIOXOLANE ANESTHETICS

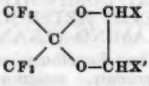
Ross C. Terrell, Plainfield, and George L. Moore, South Plainfield, N.J., assignors to Airco, Inc.

No Drawing. Filed July 15, 1971, Ser. No. 163,112

Int. Cl. A61k *27/00*

U.S. Cl. 424—278 10 Claims

The disclosure is of fluorine or chlorine-substituted 2,2-bis(trifluoromethyl)-1,3-dioxolanes having the formula:



in which X is Cl or F, and X′ is H, Cl or F, with the proviso that when X is Cl, X′ is H or F. These compounds are useful as anesthetics and as solvents and dispersants for fluorinated materials.

3,749,792

METHOD OF PREPARING BORIC OXIDE

Thomas M. Cromwell, Lancaster, and Robert W. Sprague, Santa Ana, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 676,705, Oct. 20, 1967. This application July 16, 1971, Ser. No. 163,465

Int. Cl. C01b *35/00*

U.S. Cl. 423—278 9 Claims

Boric oxide is produced by heating boric acid containing up to about 6% alkali metal chloride or sulfate and

from about 1 to 25% free water to a temperature of at least about 900° C. Preferably a temperature of 950° to 1100° C. is employed.

3,749,793

ETHER COMPOUNDS AS INHALATION ANESTHETICS

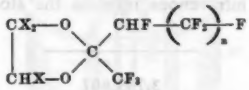
Ross C. Terrell, Plainfield, and George L. Moore, South Plainfield, N.J., assignors to Airco Inc.

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,401

Int. Cl. A61k 27/00

U.S. Cl. 424—278 2 Claims

Cyclic ether compounds of the formula



wherein *n* is zero or one, and each X is F when *n* is zero and is H when *n* is one, are useful as inhalation anesthetics.

3,749,794

ETHER COMPOUNDS AS INHALATION ANESTHETICS

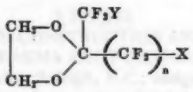
Ross C. Terrell, Plainfield, and George L. Moore, South Plainfield, N.J., assignors to Airco, Inc.

No Drawing. Filed Aug. 13, 1971, Ser. No. 171,735

Int. Cl. A61l 27/00

U.S. Cl. 424—278 2 Claims

Cyclic ether compounds of the formula



wherein X is H or F, Y is H or F, and *n* is 0 or 1, with the provisos that when X is F then *n* is 1, and when Y is F then *n* is 0 and X is H, are useful as solvents and dispersants for fluorinated materials. In addition, those compounds wherein when *n* is 1 then X is F and Y is H, and when *n* is 0 then X is H and Y is F—i.e., 2-difluoromethyl-2-trifluoromethyldioxolane and 2 - trifluoromethyl dioxolane—are useful as inhalation analgesics and anesthetics.

3,749,795

METHOD OF STERILIZING USING CYCLOPROPANE CARBOXYLIC ALKYL CARBONIC ANHYDRIDE

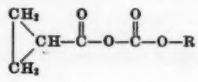
Robert K. Krueger and Peter D. Bayne, Shorewood, and Steven S. Weston, Milwaukee, Wis., assignors to Nutrico, Inc., Milwaukee, Wis.

No Drawing. Original application Sept. 27, 1967, Ser. No. 671,101, now abandoned. Divided and this application Mar. 29, 1971, Ser. No. 129,150

Int. Cl. A01n 9/24

U.S. Cl. 424—301 3 Claims

This invention relates to a method for eliminating growth and reproduction of microorganisms by use of a compound having the formula:



where R is hydrogen or a carbon-containing radical having up to 24 carbon atoms. When added to a perishable material, the compound will eliminate microorganism activity and will decompose to form generally neutral products.

3,749,796

INSECTICIDAL AND ACARICIDAL COMPOSITIONS AND METHODS OF COMBATTING INSECTS AND ACARIDS USING DIALKYLAMINOBENZHYDRYL DICARBOXYLATES

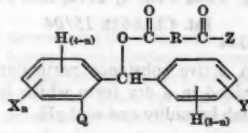
Sidney B. Richter and David P. Mayer, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Original application Oct. 20, 1969, Ser. No. 867,891, now Patent No. 3,655,731, dated Apr. 11, 1972. Divided and this application Jan. 5, 1972, Ser. No. 215,667

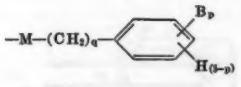
Int. Cl. A01n 9/06, 9/20

U.S. Cl. 424—304 3 Claims

This invention discloses insecticidal and acaricidal compositions and method of combatting insects and acarids using compounds of the formula



wherein X and Y are independently selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, cyano, nitro and haloalkyl; Q is dialkylamino; R is an alkylene or alkenylene group of up to eight carbon atoms; *m* and *n* are each integers from 0 to 3; and Z is selected from the group consisting of hydroxy, alkoxy, haloalkoxy, amino, alkylamino, dialkylamino and



wherein M is selected from the group consisting of oxygen and —NH—; B is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, cyano, nitro and haloalkyl; and *q* and *p* are integers from 0 to 5.

3,749,797

ANALGESIC COMPOSITIONS

Joseph A. Miller, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 831,699, June 9, 1969. This application July 2, 1971, Ser. No. 159,564

Int. Cl. A61k 27/00

U.S. Cl. 424—308 6 Claims

Improved analgesic compositions comprising, in combination, α-*d*-1,2-diphenyl - 2 - propionyloxy-3-methyl-4-dimethylaminobutane (α-*d*-propoxyphene), or a pharma-

ceutically acceptable acid addition salt thereof, and namoxyrate; and methods of employing such improved analgesic compositions to obtain enhanced analgesia.

3,749,798

1-CHLORO - 1 - HYDROPERFLUOROBUTYL DIFLUOROMETHYL ETHER AS AN INHALATION ANESTHETIC

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc.

No Drawing. Filed Oct. 7, 1971, Ser. No. 187,572

Int. Cl. H61k *27/00*

U.S. Cl. 424—342 2 Claims

1-chloro-1-hydroperfluorobutyl difluoromethyl ether of the formula

$$CF_3—CF_2—CF_2—CHCl—O—CHF_2$$

is useful as an inhalation anesthetic.

3,749,799

STABLE DRY VITAMIN A PREPARATIONS

Winifred Cort, Little Falls, and Harold Leon Newmark, Maplewood, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Feb. 4, 1972, Ser. No. 223,695

Int. Cl. A61k *15/04*

U.S. Cl. 424—344 12 Claims

A vitamin A active substance particularly vitamin A acetate, is provided in a dry form which is stable under conditions of high humidity and acid pH.

3,749,800

STABLE COMPOSITION FOR DISPENSING PGE_2

Randall G. Stehle and Thomas O. Oesterling, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,104

Int. Cl. A61k *27/00*

U.S. Cl. 424—318 7 Claims

PGE_2 is successfully dispensed for enteral or parenteral administration, especially for intravenous infusion, by preparing a concentrated stock solution in an anhydrous, water-miscible, pharmacologically-acceptable alcohol; storing the stock solution at a temperature low enough to prevent excessive dehydration; and, prior to administration, diluting the stock solution into a liquid or solid vehicle. For intravenous infusion the stock solution is sterilized.

3,749,801

STABILIZED TRANS-DIETHYLSTILBESTROL COMPOSITION AND PROCESS OF MAKING SAME

James J. Brader, Jr., and Richard W. Griscom, Morristown, Tenn., assignors to Chemetron Corporation, Chicago, Ill.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,928

Int. Cl. A61k *27/00*

U.S. Cl. 424—346 11 Claims

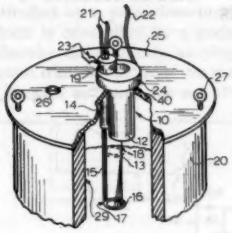
In an edible vegetable oil environment in which isomerism occurs, diethylstilbestrol is stabilized in the active trans form by the presence of a stabilizing quantity of an acidic phosphorus compound.

3,749,802

VESSEL PREHEATING METHOD AND APPARATUS

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corporation, Raleigh, N.C.

Filed Aug. 24, 1972, Ser. No. 283,514
Int. Cl. H05b 7/00
U.S. Cl. 13—1 5 Claims



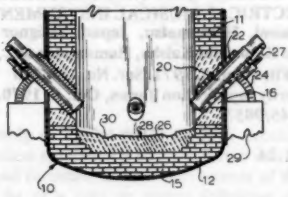
A vessel preheating method and apparatus are directed to a long arc column forming plasma generator utilizing an external movable electrode to generate a long transferred arc column. Means are provided for positioning the arc column within a vessel whereby to radiatively and convectively preheat the vessel to a desired temperature.

3,749,803

TROUGH HEARTH CONSTRUCTION AND METHOD FOR PLASMA ARC FURNACE

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corporation, Raleigh, N.C.

Filed Aug. 24, 1972, Ser. No. 283,552
Int. Cl. H05b 7/18
U.S. Cl. 13—9 13 Claims



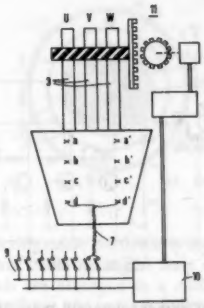
An improved hearth construction and method are disclosed for plasma arc furnaces adapted for melting metallic raw or scrap materials and are based on using a shaped receptacle, e.g., an annular-shaped trough, integrally molded into the furnace hearth which enables molten metallic materials to rapidly accumulate and the molten accumulated materials to be contacted by long arc plasma columns very early in the melting procedure, thereby substantially reducing the damage to torch parts due to arc flashing and improving the operating efficiency.

3,749,804

METHOD FOR DETERMINING THE DEPTH OF IMMERSION OF ELECTRODES IN A REDUCTION FURNACE

Johann Thomas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 18, 1972, Ser. No. 218,766
Claims priority, application Germany, Jan. 25, 1971, P 21 03 216.6
Int. Cl. H05b 7/12
U.S. Cl. 13—13 3 Claims



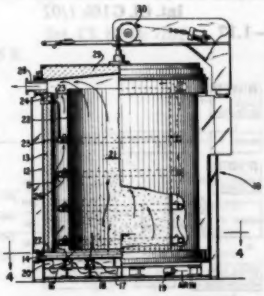
A method of determining the immersion depth of electrodes in a reduction furnace which includes measuring the voltage distribution occurring on the furnace wall produced by the currents induced therein. These currents are induced by the magnetic field developed in response to furnace currents flowing from the electrodes during operation of the furnace.

3,749,805

FLUID BED FURNACE

Karl H. Seelandt, Contoocook, N.H., and Hobart L. Wentworth, Barrington, Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Nov. 26, 1971, Ser. No. 202,269
Int. Cl. F27b 15/00; H05b 3/60
U.S. Cl. 13—20 11 Claims



A fluid bed furnace has an electric heating coil mounted on the outer face of a guard element frame which is positioned within the shell of the furnace so as to be immersed in the granular material comprising the fluid bed material. The guard element frame and heating coil comprise an assembly which can be removed as a unit from the furnace. A seal is provided

on the outer face of the bottom edge of the shell to prevent entry of granular material into the layer of insulation on the outside of the shell.

3,749,806

ELECTRONIC KEY MUSICAL INSTRUMENT

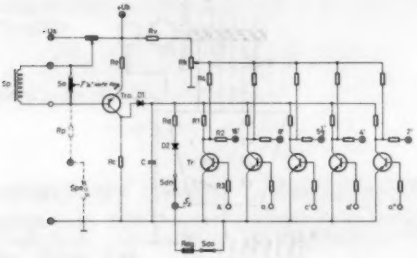
Werner Rosenberg, Bruder Grimm-strasse 10, 6236 Eschborn, Germany

Filed Dec. 6, 1971, Ser. No. 204,858

Claims priority, application Germany, Dec. 16, 1970, P 20 61 985.3

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.13 **16 Claims**



An electronic instrument wherein manually operated keys are coupled to a magnetic circuit for controlling flux changes therein, and a pick-up coil develops a voltage whose amplitude is proportional to impact strength of striking the key, and whose duration indicates duration of key depressing movement. The pick-up voltage charges a capacitor which is discharged through a transistor gating circuit receiving tone frequency signals whereby these signals are attenuated in accordance with the charge state of the capacitor; several variations of this circuit and supplemental circuitry is disclosed for tone control, simulation of particular instruments, percussion, sustain and other effects.

3,749,807

ORCHESTRAL EFFECT PRODUCING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

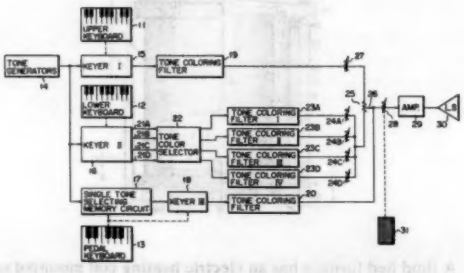
Takeshi Adachi, 600-62 Tomitsuka-cho, Hamamatsu-shi, Japan

Filed Apr. 11, 1972, Ser. No. 242,917

Claims priority, application Japan, Apr. 14, 1971, 46/23630; July 2, 1971, 46/48673

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.17 **19 Claims**



An orchestral effect producing system for an electronic musical instrument comprising a first keyboard for a melody performance and a second keyboard for accompaniment to the melody performance on which several keys are normally operated at the same time. A keyer derives from tone generators tone signals corresponding to the simultaneously operated keys in response to key operations on the second keyboard. The tone signals thus generated are separately supplied to tone coloring filters having different frequency characteristics to obtain differently colored tone signals, thus furnishing a melody performance on the first keyboard with an orchestral accompaniment effect bearing the tone colors of various musical instruments.

3,749,808

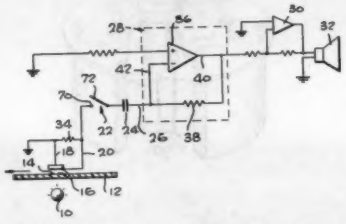
LOW DISTORTION OPTICAL ORGAN

Carl S. Nelson, Jr., Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 24, 1972, Ser. No. 237,849

Int. Cl. G10h *3/06*

U.S. Cl. 84—1.18 **7 Claims**



An organ of the type which includes a disc with optical tracks and a row of photovoltaic cells that generate an output dependent upon the light shining through the tracks, which reproduces the sounds recorded on the tracks with a minimum of distortion. An amplifier for coupling to each photocell has an input impedance that is at least an order of magnitude less than of the cell, so that the amplifer substantially short circuits the cell to cause operation of the cell in a current mode, the amplifier generating a large voltage output proportional to the current through the cell. A switch for connecting each cell to the amplifier has a resistance which varies continually from an initial value greater than the internal impedance of the cell to a value that is an order of magnitude less than the impedance of the cell.

ERRATUM

For Class 84—1.22 see:
Patent No. 3,748,944

3,749,809

CIRCUIT ARRANGEMENT CAPABLE OF CONTINUOUSLY VARYING TONE COLORS FOR ELECTRICAL MUSICAL INSTRUMENTS

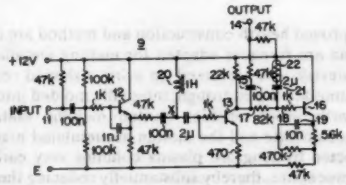
Naoyuki Niinomi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Oct. 4, 1971, Ser. No. 186,255

Claims priority, application Japan, Oct. 5, 1970, 45/86915; Oct. 5, 1970, 45/98536

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **4 Claims**



A circuit arrangement connected between tone signal generators and a loud-speaker so as to continuously vary tone colors by successively changing the relatively narrow frequency bands of tone signals transmitted from the tone generators

to the loud speaker over a relatively broad frequency range of tone signals. There are supplied tone signals to a variable gain amplifier having a feedback reactive impedance element disposed between the output and input with the magnitude of a reactive input impedance controlled by the Miller effect. To constitute a resonance circuit or filter jointly with the feedback reactive input impedance of the amplifier there is connected to the input terminal of the variable gain amplifier a fixed reactive impedance element or a feedback reactive impedance element associated with another variable gain amplifier. The variable gain amplifier has its gain continuously and reciprocally controlled by a potentiometer or photoconductive element which is controlled by a pedal operated with player's foot, thereby continuously varying the frequency band of tone signals transmitted from the tone signal generators to the loud-speaker to obtain the so-called wow-wow effect.

3,749,810

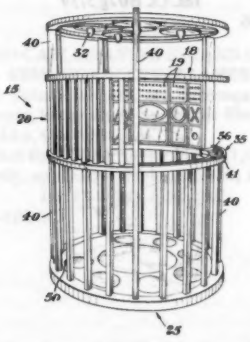
CHOREOGRAPHIC MUSICAL AND/OR LUMINESCENT APPLIANCE

Alden B. Dow, 315 Post St., Midland, Mich.

Filed Feb. 23, 1972, Ser. No. 228,658

Int. Cl. G10h 1/02

U.S. Cl. 84—1.24 **10 Claims**



An assembly or apparatus unit which provides a choreographic musical appliance is so constructed and constituted as to permit and facilitate desired movements of the performer, which can be of a type or nature following choreographic and/or impressionistic patterns, to produce and provide therewith musical sounds, creations, and effects which may be accompanied by lighting effects or may have in interrupted or continuous sequence the musical effects with or without the visual influence. At least a single and usually a plurality of consoles and/or other electronically activatable elements are provided which produce on a preselected and determinable basis, the desired musical and tonal sounds and/or light effects as the performer moves about within the instrument. The hands, feet, and other parts of the body as moved and positioned by the performer actuate the sound and/or light producing devices of the instrument so that both audible and, if desired, luminescent effects are produced, separately and individually or in combination, in coordination and synchronization with the performer operating and moving about within the apparatus.

3,749,811

SUPERCONDUCTING CABLE

Gunther Bogner, Tennenlohe, and Fritz Schmidt, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 3, 1972, Ser. No. 231,669

Claims priority, application Germany, Mar. 10, 1971, P 21 11 515.1

Int. Cl. H01v 11/00

U.S. Cl. 174—15 C **11 Claims**

A superconducting cable particularly suitable for use as an alternating-current cable having at least one coaxial pair of conductors which are arranged in a coolant pipe, with the respective tubular inner and outer conductors being separated from each other by a plastic material insulation. The plastic insulation is designed as a tubular carrier that is flexible at room temperature, and the inner and outer conductors each consist of a ribbon made up of both a superconducting metal and an electrically normal-conducting metal which is wound in a single-layer helix form. The helix forming the inner conductor is in contact with the inside of the plastic tubular carrier while the helix forming the outer conductor is wound on the outside of such plastic tubular carrier. The cable can be assembled from prefabricated sections.

3,749,812

HIGH VOLTAGE CABLE

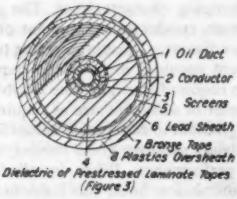
Edward Henry Reynolds, 16 Court Lane Gardens Dulwich S.E. 21, London, and Derek Reginald Edwards, 19a Nelson Rd., Windsor, both of England

Continuation-in-part of Ser. No. 82,603, Oct. 21, 1970, abandoned. This application Apr. 3, 1972, Ser. No. 240,510

Claims priority, application Great Britain, Oct. 22, 1969, 51,783/69

Int. Cl. H01b 7/02

U.S. Cl. 174—25 R **12 Claims**



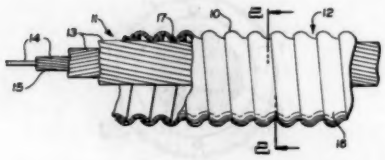
In a fluid-filled cable for service at 200 kV and upwards a low-viscosity naphthene-free mineral oil is used to impregante a paper/polypropylene/paper laminate. The polypropylene is selected for low solubility in the oil, and the paper has a density of 0.85Mg/m³ or less, an impermeability of at least 10,000 Gurley seconds, and a thickness, at least in the inner high-stress zone of the dielectric, of 50 micrometers or less, preferably 25 micrometers.

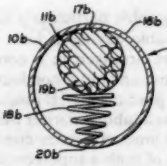
3,749,813

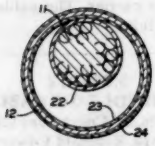
EXPANDED SELF-DAMPING ELECTRICAL CONDUCTOR

Alexander N. Shealy, 701 Mt. Vernon Rd., Newark, Ohio

Filed May 31, 1972, Ser. No. 258,455
Int. Cl. H02g 7/14; H01b 5/00
U.S. Cl. 174—42 14 Claims







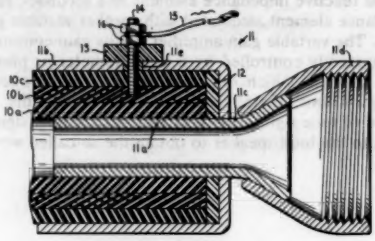
An expanded, self-damping conductor structure is provided in which the overall diameter and the peripheral surface area exposed to the surrounding air can be made very large as compared to the material used, and in which there are inherent superior self-damping characteristics. The conductor is comprised of a main conductor component or element enclosed within a larger diameter flexible shielding tube. The main conductor element provides most of the required conductance and all of the required strength. The flexible tube provides an overall diameter of sufficient size as required to limit the surface voltage gradient to acceptable values for the transmission voltage involved, assuring good corona, audible noise and radio noise performance. When installed under tension in overhead transmission lines, the tensioned main conductor element supports itself and the nontensioned, loose-fitting outer flexible tube, and the entire conductor throughout its length constitutes an effective vibration damper of the festoon type. The wind induced intermotion of the flexible tube and the main conductor element causes clashing and rubbing which action dissipates vibration energy and enhances the self-damping characteristics of the conductor. The conductor structure has the unique design advantage that the conductance, strength and diameter can be independently controlled within wide limits of design.

3,749,814

ELECTRICAL CONDUCTING HYDRAULIC HOSE

Richard L. Pratt, 8101 N. San Rafael, Kansas City, Mo.

Filed Nov. 6, 1972, Ser. No. 303,849
Int. Cl. F16l 11/12
U.S. Cl. 174—47 8 Claims



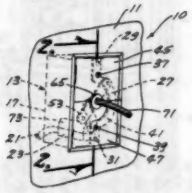
A hydraulic pressure hose adapted for electrical conduction through the steel reinforcing layer of the hose by insulating each hose end from the hose fitting and by providing each fitting with insulated terminals which extend inwardly to contact the conductive reinforcing layer.

3,749,815

FLUSH BOX FOR PLUG RECEPTACLES

Daniel J. Boatwright, 2616 62nd St., and Lloyd T. Hatcher, 9332 Carpenter, both of Des Moines, Iowa

Filed Mar. 20, 1972, Ser. No. 236,140
Int. Cl. H02g 3/14
U.S. Cl. 174—66 9 Claims



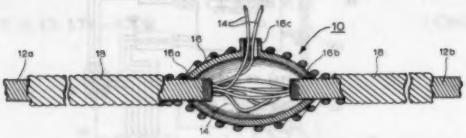
A flush box for plug receptacles is disclosed herein which generally comprises a box means including an open face at one side thereof. A cover element is mounted on the open face of the box means and comprises first and second plate elements which are pivotally secured together. The plate members cooperate to form the external peripheral shape of the cover element. The plate elements each have a semi-circular access opening formed therein opposite to each other and complementary therewith so as to define a circular access opening when the plate elements are in their normal closed position. A flexible conduit extends through the circular access opening into the box means and has a first plug element secured thereto which matingly engages a second plug element in the box means. A flat hinge member pivotally connects the plate elements together to permit one of the plate elements to be moved with respect to the other plate element to permit the first plug element to be easily inserted into the box means or withdrawn therefrom when the one plate element has been pivotaly moved with respect to the other plate element. Means is also provided to yieldably maintain the plate elements in their assembled or closed position. A resilient grommet is positioned in the circular access opening when the plate elements are in their closed position.

3,749,816

CONDUCTOR BREAKOUT

Charles R. Shaw, North Olmsted, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

Filed May 8, 1972, Ser. No. 251,456
Int. Cl. H02g 15/14
U.S. Cl. 174—70 R 8 Claims



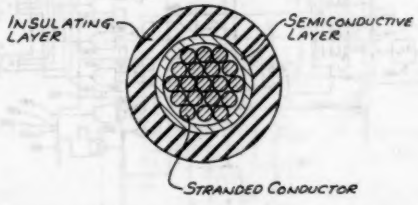
The disclosed appliance permits mid-span access to the electrical conductors of an electromechanical cable without loss of cable strength thereby enabling electronic instrumentation or the like to be selectively disposed along the cable length. A hollow shell includes a central conductor receiving cavity and opposed apertured end portions for receiving respective ends of the cable. Helically preformed rods are wrapped about the housing and extend in opposite directions along the sectional cable in tightly encircling and gripping relation therewith to effect a secure interconnection of the cable sections. Other features are disclosed.

3,749,817

INSULATED CABLE HAVING STRAND SHIELDING SEMI-CONDUCTIVE LAYER

Tetsuya Shiga; Yutaka Inagaki, and Hironaga Matsubara, all of Osaka, Japan, assignors to Sumitomo Electric Industires, Ltd., Higashi-ku, Osaka, Japan

Filed Dec. 22, 1971, Ser. No. 211,072
Claims priority, application Japan, Dec. 28, 1970, 45/24503
Int. Cl. H01b 3/30, 7/02
U.S. Cl. 174—102 SC 3 Claims



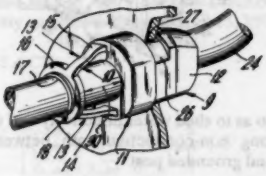
This invention relates to an insulated cable having an extruded strand shielding semi-conductive layer, and especially to an insulated cable which is characterized by using a blend of high density polyethylene and ethylene propylene rubber as the extruded strand shielding semi-conductive layer, the quantitative ratio of the high density polyethylene in the blend being 20 – 50 weight percent.

3,749,818

ELECTRIC CORD STRESS RELIEF COMBINED WITH A STRAIN RELIEF GROMMET

William Jemison, Summit, N.J., assignor to Heyman Manufacturing Company, Kenilworth, N.J.

Filed Sept. 30, 1971, Ser. No. 185,314
Int. Cl. F16l 5/00; H01b 17/26
U.S. Cl. 174—153 G 21 Claims



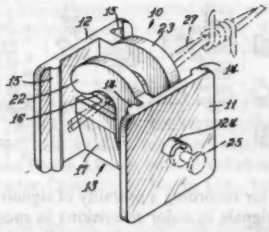
A stress relief is integrally joined to a strain relief bushing providing a spaced-away hold to a line cord providing an axis of movement relieving wire stress movement.

3,749,819

CORELESS DOUBLE FLANGED INSULATOR

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products, Incorporated, Battle Creek, Mich.

Filed Oct. 30, 1972, Ser. No. 302,293
Int. Cl. H01b 17/16
U.S. Cl. 174—158 F 8 Claims



An insulator for supporting an electrically charged wire on a fence post, integrally molded from a plastic material, comprising a pair of parallel spaced apart flanges connected by an axially oriented body in the form of a trough having a U-shaped channel, the flanges being free of axial apertures, and the outer flange having means for guiding a nail to be driven through the flange, into the U-shaped axial channel, through the other flange, and into a wooden post.

3,749,820

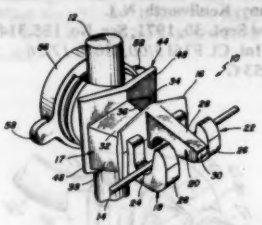
ELECTRIC FENCE INSULATOR

Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn.

Filed July 14, 1972, Ser. No. 271,990
Int. Cl. H01b 17/16; A01k 3/00
U.S. Cl. 174—163 F 17 Claims

Our all plastic insulator includes a body having two upwardly facing and forwardly projecting hook-shaped members with a sufficiently resilient central tongue therebetween so that the tongue can be flexed upwardly to permit insertion of the electric fence wire into the two hooks, the tongue thereafter preventing undesired removal of the wire. A threaded barrel extends rearwardly from the body and by reason of an elongated slot tapered at its forward end various

diameters of fence posts can be accommodated, a nut on the threaded barrel providing the clamping action. The body is



structured so as to shed water effectively and also to provide a relatively long non-conductive path between the charged fence wire and grounded post.

3,749,821

SYSTEM FOR RECORDING AND REPRODUCING A PLURALITY OF SIGNALS

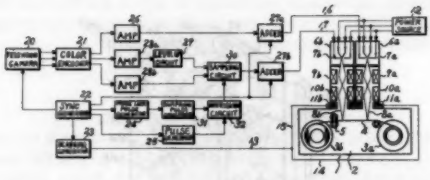
Sakae Miyauchi; Kazumitsu Tanaka; Shinji Takayanagi, and Kenji Kawakami, all of Tokyo, Japan

Filed Aug. 24, 1971, Ser. No. 174,411

Claims priority, application Japan, Aug. 27, 1970, 45/75214; Sept. 3, 1970, 45/77308; Mar. 31, 1971, 46/19368; Apr. 12, 1971, 46/22932; Apr. 14, 1971, 46/23558; Apr. 14, 1971, 46/23559; Apr. 23, 1971, 46/26489; May 21, 1971, 46/134481

Int. Cl. H04n 9/02

U.S. Cl. 178—5.2 D **26 Claims**



A system for recording a plurality of signals (e.g., the I and Q chroma signals in color television) in monochrome on a radiant energy sensitive recording medium by intermittently sampling in turn the signals to be recorded after having brought about a difference of intensity to the said signals and by modulating the intensity of periodically scanning radiation energy beam by means of the sampled signals.

3,749,822

ANIMATION METHOD AND APPARATUS

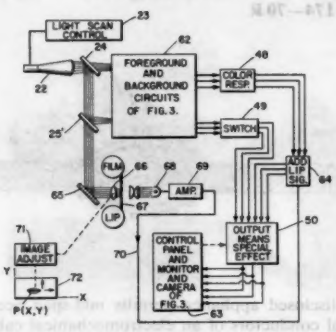
Frank Willard Van der Veer, 5221 Topeka Dr., Tarzana, and Barry Allaire Nolan, 18942 Goodvale Rd., Saugus, both of Calif.

Filed Dec. 30, 1971, Ser. No. 213,918

Int. Cl. H04n 5/22

U.S. Cl. 178—5.2 **7 Claims**

Animating procedures are simplified by selecting stock film footage of typical foreground and background scenes, optically scanning the scenes to convert them into first and second sets of video color signals, and electronically combining the first and second sets of signals to effectively superimpose the selected foreground characters onto the selected background scenes, the resulting output video signals being converted into an optical image which may then be photographed. The superposition of the foreground characters onto the selected background is accomplished by initially providing the stock foreground film footage in the form of characters against a screen of a given uniform color, the characters themselves being of different color. The one video signal corresponding to the uniform color of the foreground scene is utilized to switch the sets of signals in such a manner that the first set of signals



depicting the foreground is only provided at the output in the absence of the one video signal and the second set of signals corresponding to the background is provided at the output only when the one video signal is present.

3,749,823

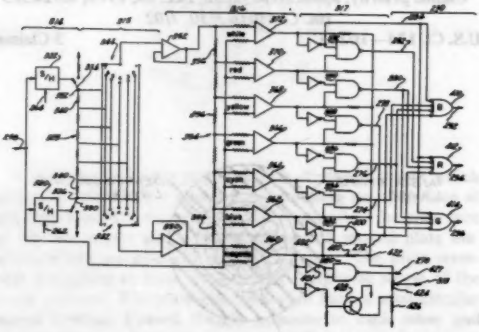
SIGNAL PROCESSING CIRCUIT

Dwight Allen Warner, Westland, Mich., assignor to Daedalus Enterprises, Inc., Ann Arbor, Mich.

Filed Nov. 26, 1971, Ser. No. 202,562

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 R **12 Claims**

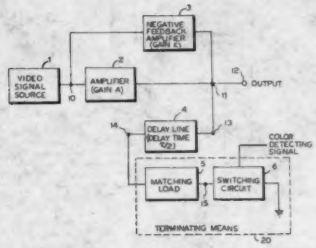


Thermal ground data and thermal reference data acquired by an airborne scanner are recorded on magnetic tape along with timing signals synchronized with the scanning. At some later time, the signals are played back and processed to produce a color image on a line-scanned cathode ray tube and the image is recorded on a continuous color film strip. Ground data signals are processed by a particular analog-to-digital converter to provide digital signals according to the instantaneous level of the thermal ground data compared to discrete reference levels which in turn are calibrated according to the thermal reference data. The digital signals gate color guns in the cathode ray tube at fixed intensity levels so that the color image is composed of a predetermined number of colors.

3,749,824
SUPPRESSION FILTER FOR CARRIER-CHROMINANCE SIGNALS UTILIZING A TOPPED DELAY LINE

Takayuki Sagishima, Moriguchi; Reiichi Sasaki, Hirakata, and Yoshitomi Nagaoka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Osaka, Japan

Filed June 11, 1971, Ser. No. 152,152
Claims priority, application Japan, July 20, 1970, 45/64079; July 20, 1970, 45/64080
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 R 2 Claims

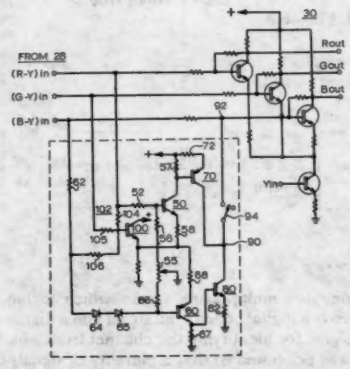


A suppression filter for carrier-chrominance signal components in color picture signals for the luminance channel of a color television receiver which acts only when color picture signals are being received. The filter has a delay line with an appropriate delay time, one end of which is open-circuited to reflect the signals when color picture signals are being received and which has a characteristic impedance which can be coupled to the one end so that it does not reflect the signals when monochromatic picture signals are being received.

3,749,825
AUTOMATIC HUE CONTROL CIRCUIT

John H. Moore, Broadview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 16, 1971, Ser. No. 208,770
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE 9 Claims

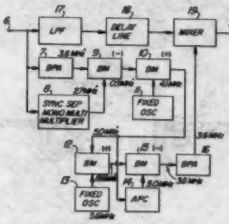


A novel automatic hue control arrangement wherein only the (B–Y) color-difference signal is altered from nominal, and only within a predetermined, limited range about reference fleshtone axis. The result is more pleasing fleshtone hues of a substantially less monochrome cast since those hues outside the fleshtone range remain completely unaltered. Accordingly, the grass remains green, the sky blue. In the preferred embodiment, a correction voltage is readily and conveniently derived from the processed (R–Y) and (G–Y) color-difference information and added to the nominal (B–Y) signal so as to provide essentially uniform response therefor over the predetermined range about nominal fleshtone. A viewer-operated switch is provided for selecting the normal or fleshtone compensating mode for the receiver.

3,749,826
COLOR TELEVISION SIGNAL REPRODUCING SYSTEM

Ichiro Arimura, Kyoto, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Kadoma-shi, Osaka, Japan

Filed May 11, 1971, Ser. No. 142,329
Claims priority, application Japan, May 13, 1970, 45/41239
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 CD 4 Claims

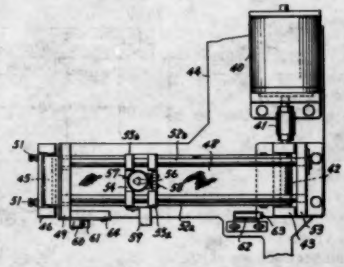


A color television signal reproducing system in which a NTSC composite color television signal recovered from a magnetic recording and reproducing system such as a VTR and containing timing error information is processed to produce a continuous reference signal locked to timing variations in the horizontal sync signal which is separated from the composite signal. The composite signal is processed with the reference signal thus derived by means of balanced modulation to obtain a timing error corrected color subcarrier signal containing reduced timing error components.

3,749,827
ENDLESS NON-METALLIC BELT FOR INTERMITTENTLY MOVING A TRANSDUCER HEAD TRANSVERSELY ACROSS A ROTARY MAGNETIC DISC

Hisao Kinjo, and Fumio Akuwa, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama-City, Japan

Filed Oct. 30, 1970, Ser. No. 85,463
Claims priority, application Japan, Nov. 1, 1969, 44/87270; Aug. 17, 1970, 45/71874
Int. Cl. H04m 5/78; G11b 21/08
U.S. Cl. 178—6.6 DD 15 Claims



An intermittent feeding device provides a translation and intermittent feed to a recording and reproducing head used for cooperating with a rotary recording medium. An intermittent rotation driving source, such as a stepping motor, drives a belt intermittently thereby causing the transducer head secured on the belt to make intermittent stepping movements.

Vibrations, such as a hunting of the rotary driving source, are absorbed by the belt and not transmitted to the tip of the transducer head.

3,749,828

METHOD FOR IMPROVING THE CENTERING OF STAMPING MATRICES FOR SOUND AND VIDEO DISCS

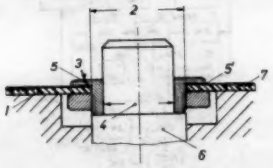
Herbert Knothe, Neumunster; Klaus Roschmann, Nortorf, and Werner Rohwer, Ellerdorf/Uber Nortorf, all of Germany, assignors to Teldec Telefunken-Decca Schallplatten G.m.b.H., Hamburg, Germany

Filed Nov. 23, 1971, Ser. No. 201,380

Claims priority, application Germany, Nov. 23, 1970, P 20 57 478.1

Int. Cl. G11b *3/64, 3/70*

U.S. Cl. 178—6.6 B **4 Claims**



The care and accuracy of centering the negative, e.g. the master or stamping matrix, used in the production of sound and video record discs is improved by preparing the original lacquer foil record so that the negative will have a profile which extends centrically to the record groove spiral. This is accomplished by inserting a centering core, which is adapted to the spindle of the playback system and has a laterally extending flange defining a galvanically reproducible centering edge, into a centering hole in the foil prior to the cutting of the spiral groove containing the recorded information into the lacquer foil.

3,749,829

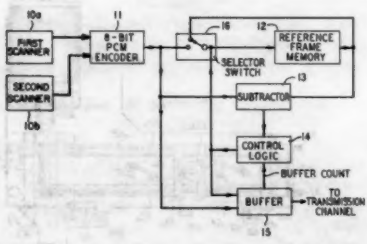
SLOW SCAN PROCEDURE FOR HIGH RESOLUTION GRAPHICS MODE VIDEO SCENE COMPATIBLE WITH CONDITIONAL REPLENISHMENT TYPE OF BANDWIDTH REDUCTION

Harry Shaner Burns, Oceanport; Richard Carrel Miller, Summit, and Helmuth Otto Sautter, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 14, 1971, Ser. No. 143,520

Int. Cl. H04n *7/12*

U.S. Cl. 178—6.8 **4 Claims**



A slow scan, high resolution video signal is rendered compatible with a video bandwidth reduction technique known as conditional replenishment by a unique scan in which a single master frame is compiled by scanning of successive subframes. Each successive subframe consists of a small number of master frame lines which are spatially separated from each other in the master frame by a uniform distance, and which are adjacent to the lines of the preceding subframe.

3,749,830

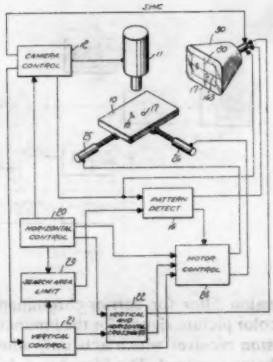
PATTERN SENSING AND POSITIONING SYSTEM

Frank H. Blitchington, Jr., Greensboro, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Apr. 9, 1968, Ser. No. 719,923

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **26 Claims**



Circuitry senses a particular pattern or indicia in the output of a video camera to produce a pulse indicative of the position of the pattern. A control circuit senses the time of the pulse relative to respective horizontal and vertical control pulses to drive a positioning mechanism to position the pattern or indicia in accordance with the horizontal and vertical controlling pulses.

3,749,831

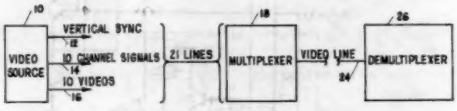
TELEVISION MULTIPLEXING SYSTEM

Lorenz G. Simpkins, Merritt Island, Fla., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 5, 1972, Ser. No. 250,766

Int. Cl. H04n *7/08*

U.S. Cl. 178—6.8 **6 Claims**



A television multiplexing system which includes a circuit that inserts a digital coded sync signal and a digital code into a video signal for identifying the channel from which the video signal was generated so that a plurality of signals can be sent over a single hard-line. The digital sync signal and the digital coded signals are generated by a single crystal controlled clock so that they are always in synchronism with each other. In demultiplexing the signals so as to feed the video signal to a proper recording channel the sync signals are utilized for shifting the digital coded signals into a shift register and the shift register, in turn, activates a decoder according to the code stored in the shift register for selecting the proper recording disc or receiver for storing the video signal.

3,749,832

BINARY CODED SIGNAL AND CIPHERING AND DECIPHERING METHOD AND SYSTEMS EMBODYING SAME

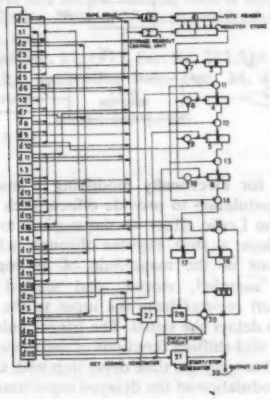
Jean H. Lemoine, Le Vesinet, France, assignor to Compagnie Internationale Pour L'Informatique, Louveciennes, France

Filed Apr. 13, 1964, Ser. No. 359,066

Claims priority, application France, Apr. 12, 1963, 63931560

Int. Cl. H04l 9/00

U.S. Cl. 178—22 6 Claims



For avoiding the transmission of coded servicing signals on a transmission path between transmitting and receiving ends of a binary coded ciphered signal syste, each ciphered signal is formed, at the transmitting end, by first ciphering, in the sequence of the plain alphabet signals, a number of successive intelligence periods lower than the lower number of such period in any plain signal, and thereafter completing said lower number of ciphered periods up to said normal number by adding at least one additional intervening arbitrary period distinguishing the thus built up signal from any servicing signal pattern in the system. The additional arbitrary periods are canceled at the receiving end and the uncanceled periods are regrouped for normal deciphering operations.

3,749,833

FACSIMILE TRANSMISSION SYSTEM

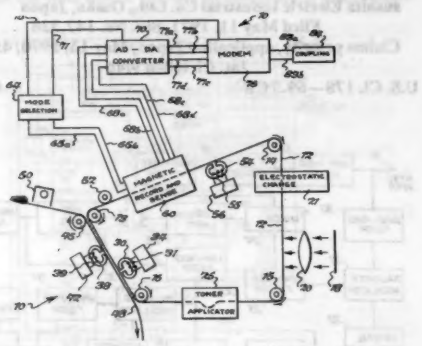
Joseph M. Rait, Buffalo; Alexander Scott Gilmour, Jr., Williamsville; Edward C. Sellers, Buffalo, and Edward Lindberg, Bowmansville, all of N.Y., assignors to Pelorex Corp., Buffalo, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,841

Int. Cl. G01d 15/02; H04n 1/10; G11b 5/02

U.S. Cl. 178—6.6 A 11 Claims

A facsimile system for transferring graphical information between two remotely located machines each controlled to operate both as a transmitter and a receiver and comprising storage means in the form of an orbitally movable magnetic tape for retaining a magnetic image of graphical information to be transferred. An image forming means optically scans an input medium such as a document and forms a magnetic image on the tape of graphical information from the input medium when the machine is to transmit. Then a signal generating means scans the magnetic image on the tape and provides signals indicative of the graphical information for transmission by wire or radiowave. When the machine is to operate as a receiver, a signal detecting means receives transmitted signals indicative of graphical information, transforms the signals, and utilizes them to form a magnetic image of the graphical information on the tape. A transfer means applies



magnetic toner particles to the magnetic image on the tape and then transfers the toner particles to a copy medium such as paper.

3,749,834

SYSTEM FOR PROCESSING SLOPE AND DURATION INFORMATION CONTAINED IN COMPLEX WAVEFORMS

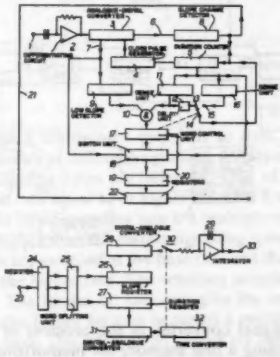
Alfred Brian Edwin Ellis, Chelmsford, England, assignor to The Marconi Company, Limited, London, England

Continuation-in-part of Ser. No. 822,401, May 7, 1969. This application May 11, 1971, Ser. No. 142,414

Claims priority, application Great Britain, May 13, 1968, 22,505/68

Int. Cl. H04l 27/00

U.S. Cl. 178—66 9 Claims

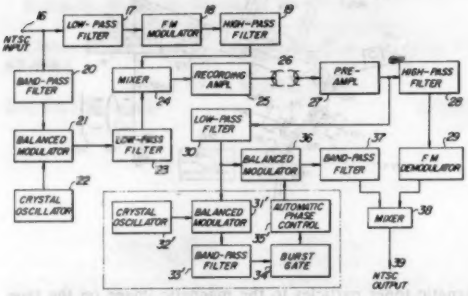


A transmission system for transmitting information contained in a complex waveform includes a transmitter in which the individual slopes forming the complex wave and the duration of these slopes are determined and converted into coded signals. These signals are transmitted to a receiver in which the coded signals are used to produce an analogue signal corresponding to the complex wave.

3,749,835
CONTINUOUS SIGNAL PRODUCING SYSTEM

Ichiro Arimura, Kyoto; Hiroshi Taniguchi, Hirakata, and Hiromichi Tanaka, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed May 11, 1971, Ser. No. 142,328
Claims priority, application Japan, May 13, 1970, 45/41240
Int. Cl. H04n 9/46
U.S. Cl. 178—69.5 CB 6 Claims

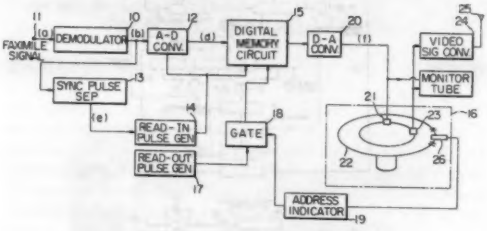


A continuous signal producing system for producing a continuous signal locked to an intermittent burst signal. The burst signal is changed to a higher frequency signal in the presence of a stable local oscillator, and the higher frequency signal thus obtained is used to drive an APC to thereby produce a continuous signal phase locked to the higher frequency intermittent burst signal.

3,749,836
IMAGE SIGNAL CONVERTER IN FACSIMILE

Heijoro Hayami; Ryuzo Kan, and Masami Kawabuchi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Kadoma City, Osaka, Japan

Filed May 30, 1972, Ser. No. 257,528
Claims priority, application Japan, May 28, 1971, 46/37336
Int. Cl. H04i 7/00
U.S. Cl. 178—69.5 TV 3 Claims

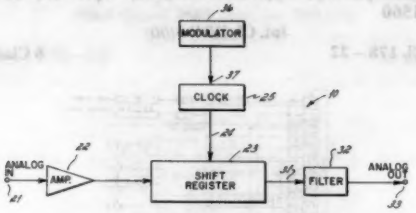


An image signal converter in the receiver of a facsimile system comprising a first memory for memorizing successive horizontal line signals contained in an image signal carried on a facsimile signal transmitted, and a second memory for consecutively memorizing the horizontal line signals by one field. The first memory is adapted to memorize the horizontal line signals reversely of the time base when the horizontal scanning direction in the sender is reversed and, on the other hand, the second memory is adapted to memorize the horizontal line signals in reverse order when the vertical scanning direction in the sender is reversed.

3,749,837
ELECTRONIC MUSICAL TONE MODIFIER FOR MUSICAL INSTRUMENTS

James A. Doughty, 1319 Garland, Texarkana, Ark.

Filed May 2, 1972, Ser. No. 248,891
Int. Cl. H04r 3/00; G10h 1/04
U.S. Cl. 179—1 J 11 Claims

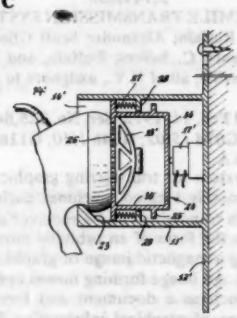


A device for electrically modifying a musical tone by frequency modulation to provide effects such as the vibrato effect and the Leslie effect on the musical tone signal. The device employs a shift register through which electrical representations of the magnitude of an input signal are periodically sampled, stored, and shifted progressively through a shift register from the input to the output of the device which delays the signal. The trigger pulses which time the sampling and shifting functions of the device are frequency modulated to vary the time delay imposed, thus effecting a frequency modulation of the delayed input tone at the output of the device. In one embodiment, a digital shift register is employed which stores a digital representation of the magnitude of the signal and is connected between an analog-to-digital convertor at the input of the device and a digital-to-analog converter at the output of the device. Alternatively, a bucket-brigade type analog shift register is employed which directly stores discrete analog representations of sampled input values and shifts them progressively toward the output. Plural channel devices are provided wherein the time delays are modified differently so that when the outputs of the channel are combined, an enhanced effect is provided. In a two channel device, opposite phase relationships of the modulated trigger pulse signals provide a more realistic vibrato effect.

3,749,838
SOUND GENERATING DEVICE FOR SIGNALING AND RESPONDING TO NUISANCE TELEPHONE CALLS

John T. Juba, 65 River Edge Farms Rd., Madison, Conn.

Filed Nov. 30, 1970, Ser. No. 93,720
Int. Cl. H04m 11/02
U.S. Cl. 179—2 C 2 Claims



A device which can be placed near a telephone set on a table or hung on the wall on which the telephone set may be placed to respond to an undesired call such as a nuisance or obscene call.

The device comprises a housing containing a battery power speaker which emits a high frequency tone or howl which can be picked up by the transmitter of the telephone set placed in an opening in the housing provided for this purpose. Placing the transmitter in the housing automatically turns on the speaker. In another embodiment the speaker is omitted and the sound connection made directly to the telephone line.

3,749,839

TDM TELECOMMUNICATION SYSTEM FOR TRANSMITTING DATA OR TELEGRAPHIC SIGNALS

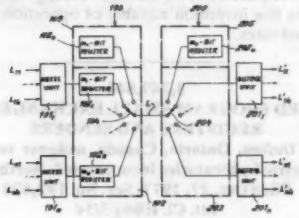
Paolo Fornasiero, and Sergio Tomasi, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens, S.p.A., Milan, Italy

Filed Dec. 27, 1971, Ser. No. 212,514

Claims priority, application Italy, Dec. 24, 1970, 33528 A/70

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BA **10 Claims**



At a multiplexing terminal of a telecommunication channel, a plurality of access units form composite words from interleaved bits or multibit characters of messages concurrently received over respective groups of incoming lines, the bits emanating from each access unit having a cadence $m_i v_o$ individual to that unit. A switching circuit cyclically samples a set of group registers in which the words from the respective access units are at least partially stored, thereby establishing a frame which consists of a sequence of m_i bits from each unit along with address bits and supplemental bits. A frame counter at the multiplexing terminal determines the completion of a superframe composed of a predetermined number of frames so chosen that all the words are restarted in their original time position within the first frame of each new superframe. An associated demultiplexing terminal comprises a similar switching circuit which directs the individual bit sequences of each frame to respective distributing units while another frame counter establishes the instants at which a word allocated to any distributing unit starts and ends, thereby enabling that unit to divide the word into its constituent characters for retransmission over corresponding outgoing lines. Synchronization of the counters at the two stations is facilitated by the periodic substitution of a special code for the address bits of a frame, the frames so marked recurring a whole number of times within each superframe.

3,749,840

TDM TELECOMMUNICATION SYSTEM DESIGNED FOR TRANSMISSION OF SUPERVISORY SIGNALS

Paolo Fornasiero, and Sergio Tomasi, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

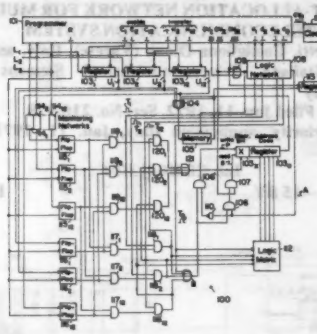
Filed Jan. 3, 1972, Ser. No. 215,130

Claims priority, application Italy, Dec. 31, 1970, 33763 A/70

Int. Cl. H04j *3/12*

U.S. Cl. 179—15 BY **10 Claims**

To indicate the active or inactive condition of any one of a group of n telegraph lines transmitting in interleaved relationship over a common channel, each line is assigned a 5-bit time slot in a recurrent cycle of n+1 time slots, the extra slot being utilized at the beginning of each cycle to register the 4-bit address of the first nontransmitting line in the series which is either idle (stop signal) or about to become active (start signal). In the time slot of the line so identified, a discriminating bit differentiating between "start" and "stop" conditions is accompanied by the four address bits identifying the next nontransmitting line in the series, and so forth; the extra time slot eliminates the need for a 6th bit to accommodate the start and stop signals in a 32-character telegraphy code.



3,749,841

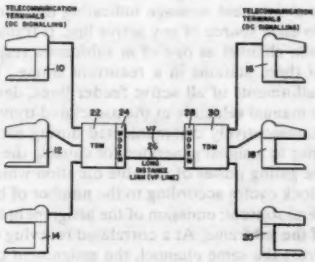
TIME DIVISION MULTIPLEXING FOR TELEX SIGNALS

Peter J. Cohen, Stony Brook, and Philip W. Ackerman, Smithtown, both of N.Y., assignors to Databit Incorporated, Hauppauge, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,807

Int. Cl. H04j *3/04*

U.S. Cl. 179—15 BA **6 Claims**



The disclosed multiplexer responds to data appearing on separate channels at different signalling speeds or bit rates. At least two sampling rates are selected. One of the sampling rates is a base rate equal to or higher than the lowest signalling speed and the other sampling rate is a multiple of the base rate equal to or higher than the fastest signalling speed. The lowest speed signals are sampled at the base rate and the higher speed signals with the higher rate. The resulting sampled data is then interleaved. The lowest bit rate occupies the normal number of slots and the higher bit rate occupies a multiple number of the low rate slots. The interleaved signals are then transmitted. To accommodate telex call-establishing signals, which may occur in the same channel at rates different from the data rate, the existence of such call-establishing signals is determined and the sampling times are adjusted. The sampled signals are regenerated into bits which are multiples of the data rate. These bits are interleaved as data. Within the multiplexer distortion is removed by regenerating the signals in each channel on the basis of the condition of the center of each bit. This s comparable to a repeater. The bit center is located by high

speed sampling techniques which count to the center of each bit on the basis of predetermined programs which are preset in accordance with the expected bit rate in each channel.

3,749,842

TIME-SLOT-ALLOCATION NETWORK FOR MULTIPLEX TELECOMMUNICATION SYSTEM

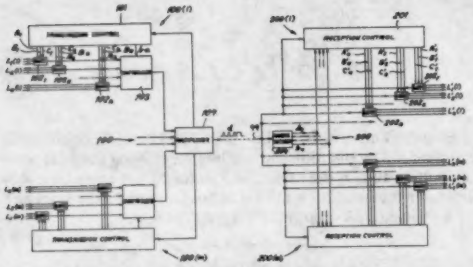
Isidoro Poretti, Castiglione Olona (Varese), Italy, assignor to Societe Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 11, 1972, Ser. No. 216,979

Claims priority, application Italy, Jan. 11, 1971, 19208 A/71

Int. Cl. H04j 3/04

U.S. Cl. 179—15 BY **10 Claims**



A transmitting station having access to a telecommunication channel shared by *m* such stations synthesizes a composite word from interleaved groups of bits supplied by *n* associated feeder lines, each group of bits consisting of up to three subgroups from a corresponding number of sources of data or telegraphic messages connected to the respective line. The composite word, along with a bit of a code word forming part of an assignment message indicating the number of bits assigned to each source of any active line, is transmitted over the common channel as one of *m* subframes respectively allocated to these stations in a recurrent frame. The current time-slot allotments of all active feeder lines, determined by respective manual selectors at the associated transmitting station, are consecutively communicated during each subframe by a scanner to a signal generator for causing the emission of up to three gating pulses of variable duration which span one or more clock cycles according to the number of bits assigned to the several sources; emission of the assignment bit occurs at the end of the subframe. At a correlated receving station connected across the same channel, the assignment of time slots within the subframe to the several sources represented by incoming data bits is ascertained by an analogous scanner cooperating with a similar generator whose gating pulses are controlled by an extraction circuit decoding corresponding code words of the accompanying assignment message.

3,749,843

DIGITAL AMPLITUDE MODULATOR

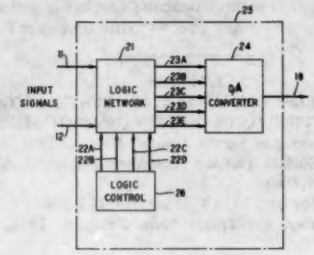
Theodore James Roycraft, Morristown, and John Robert Sheehan, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 8, 1972, Ser. No. 251,254

Int. Cl. H04j 3/04

U.S. Cl. 179—15 A **8 Claims**

An envelope modulator which shapes and combines a number of binary input signals by digital means comprises a compact combinatorial logic network, a digital-to-analog converter and a low-pass filter. The logic network operates on the binary input signals to provide at its output a plurality of binary coded bit streams representing a quantized composite of the input signals with a superimposed desired amplitude shaping. The digital-to-analog converter combines the bit streams from the logic network into a quantized signal and the low-pass filter yields a smooth line signal suitable for transmission



over bandlimited channels. The elimination of the reactive components required in conventional analog envelope modulators makes this invention capable of operation over a wide range of baud rates.

3,749,844

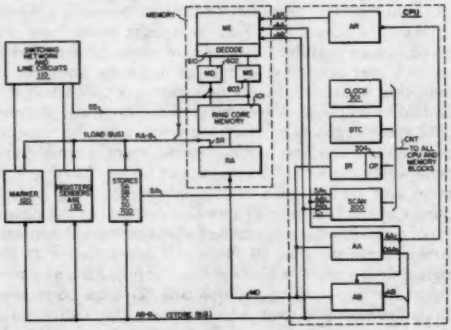
STORED PROGRAM SMALL EXCHANGE WITH REGISTERS AND SENDERS

John Peter Dufton, Ontario, Canada, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 27, 1971, Ser. No. 192,828

Int. Cl. H04q 3/54

U.S. Cl. 179—18 ES **20 Claims**



The dialing registers and the senders each include control circuits for operating independently of the central processor for functions such as line supervision, receiving and storing a plurality of digits in the registers, and outpulsing a plurality of digits from the senders. There is a pool of dialing registers, a separate pool of senders, and in addition a separate pool of automatic number identifications (ANI) units; each of which has a plurality of stores which are treated as temporary memory with addresses which are a part of the same set of addresses used for accessing the main memory. Stored program control in the central processor is used to select an idle register, idle sender, and idle ANI unit for a call as required, to supply instructions to the selected units, to analyze dialed digits stored in the dialing register, path selection for connections to the dialing registers and the senders, and other functions. Upon initiation of a call, the calling line equipment number is placed in one of the stores of the selected dialing register, and if later analysis of the dialed digits in that register indicates an outgoing call with a sender required, an idle sender is selected, the calling line number is transferred thereto, and the identity of the sender is placed in the store of the dialing register. If automatic number identification is required an ANI unit is also selected and the identity of the sender placed in a store

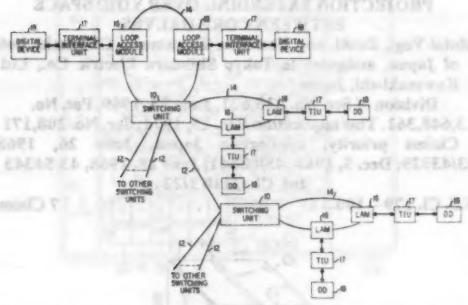
thereof. All transfer of information among the dialing registers, the senders and the ANI units is via a load bus and a store bus.

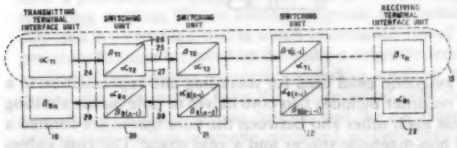
3,749,845

DIGITAL DATA COMMUNICATION SYSTEM

Alexander Gibson Fraser, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 27, 1971, Ser. No. 175,678
Int. Cl. H04j 3/16
U.S. Cl. 179—15 AL **18 Claims**





A digital data transmission system comprising a plurality of interconnected switching units, each such unit having connected thereto at least one transmission loop, and each such loop having at least one digital device attached thereto. The system provides controllable buffering of digital data thereby allowing digital devices having different data transfer speeds and storage capabilities to communicate asynchronously. The system allocates communication resources upon request but only creates actual communication paths when the requesting device is transmitting data. Thus system resources need not remain committed between bursts of data.

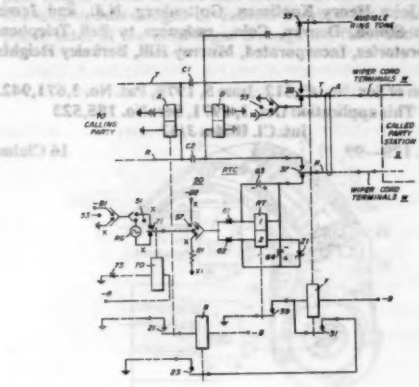
3,749,846

RING TRIP CIRCUIT

John S. Young, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 8, 1972, Ser. No. 260,842
Int. Cl. H04m 3/02
U.S. Cl. 179—84 R **7 Claims**

A ring trip arrangement for a ringing circuit including a ring trip relay having dual winding coils, rectifying means and capacitive means arranged in two series-shunt circuit combinations. Each of these circuit combinations exhibit under alternating current flow conditions substantially equal and offsetting electrical parameters including subtracting electromagnetic flux fields to maintain an inoperative energization



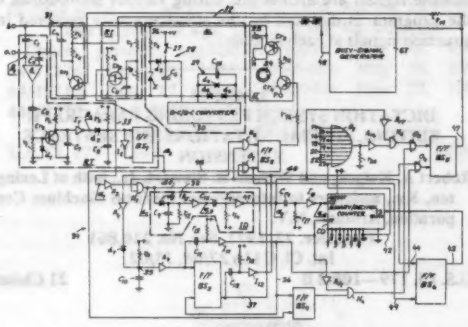
state for the relay. Under direct current flow conditions, balanced flux fields of the relay coils are upset and the ring trip relay is operated.

3,749,847

DEVICE FOR BLOCKING TOLL CALLS FROM SUBSCRIBER TELEPHONES

Luigi Piacente, Milan, and Giovanni Gandolfi, Cesano Maderno, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 5, 1971, Ser. No. 186,692
Claims priority, application Italy, Oct. 6, 1970, 30637 A/70
Int. Cl. H04m 3/38
U.S. Cl. 179—90 D **10 Claims**



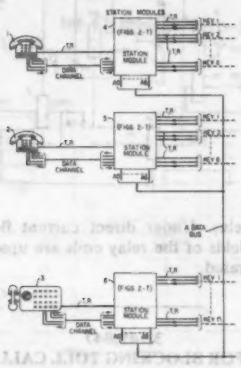
To prevent the unauthorized initiation of toll calls from a subscriber station of a telephone system, the telephone set is equipped with monitoring circuitry working into a binary/decimal counter which is activated during the dialing of the first (or some other specified) digit and, in response to one or more predetermined values of that digit, trips a flip-flop to place a shunt across the line loop with concurrent generation of a busy signal. The flip-flop is also tripped if dialing is commenced before reception of a dial tone from the central office. To prevent the generation of a spurious dial tone by voice frequencies, the microphone of the telephone receiver is short-circuited during dialing. The monitoring device, which can be manually switched off by an authorized operator, is continuously energized by the voltage drop developed across a shunt network in a quiescent state and across a series network in an active state.

3,749,848

MODULAR KEY TELEPHONE SYSTEM HAVING A DISTRIBUTED PROCESSOR ORGANIZATION

Dieter John Henry Knollman, Guttenberg, N.J., and James Louis Simon, Denver, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Division of Ser. No. 43,812, June 5, 1970, Pat. No. 3,671,942. This application Oct. 1, 1971, Ser. No. 185,523
Int. Cl. H04m 3/22
U.S. Cl. 179—99 16 Claims



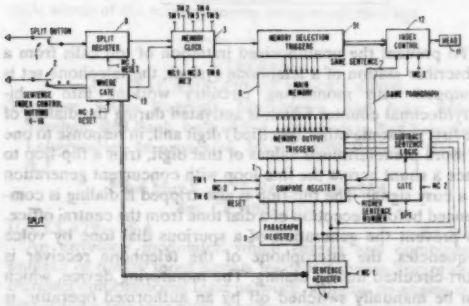
A program controlled key telephone system is disclosed. The system includes line modules and station modules which respectively provide the interface circuitry between PBX/CO lines and station set equipment. Modules are connected to a multi-phase clock which generates a reiterative list of binary coded instruction signals for directing circuit operations. Each of the modules acts simultaneously on receipt of the instruction signals to generate independently and dynamically separate work programs for each module. In addition, inter-module signals are exchanged during various subroutines in the program as directed by the simultaneously received instruction signals at each module.

3,749,849

DICTATION SYSTEM FEATURING PARAGRAPH EDITING, SPECIAL NOTATIONS AND SENTENCE EXTENSION

Robert A. Kolpek, and William R. Stewart, Jr., both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,861
Int. Cl. G11b 27/08, 15/02
U.S. Cl. 179—100.2 B 21 Claims



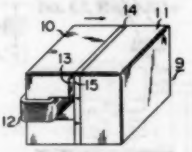
The present invention concerns a number of features for a Sentence Oriented Dictation System (SODS) having provision for recording and reproducing audio information in segments of convenient size, such as sentences and paragraphs. The present case concerns the capability of splitting the sentences in a particular paragraph into two or more groups of sentences, each comprising an individual paragraph and/or combining sentences from several paragraphs to form a single paragraph. Further, the invention concerns the provision of special areas on a record medium for the storing of instructions for guidance of the typist in the form of special notations. Also, the present invention concerns a system of this nature with provision for recording individual segments of audio information, such as sentences, in assigned storage areas on a record medium, each having storage capacity up to a certain predetermined size, and the capability of extending or continuing the sentences beyond the predetermined size.

3,749,850

MAGNETIC HEAD HAVING A WEDGE SHAPED PROJECTION EXTENDING OVER VOID SPACE BETWEEN CORE HALVES

Motoi Yagi, Zushi, and Yoshihisa Kawamura, Chigasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Division of Ser. No. 835,631, June 23, 1969, Pat. No. 3,648,361. This application Dec. 15, 1971, Ser. No. 208,171
Claims priority, application Japan, June 26, 1968, 43/43929; Dec. 5, 1968, 43/88641; June 28, 1968, 43/54343
Int. Cl. G11b 5/22
U.S. Cl. 179—100.2 C 7 Claims



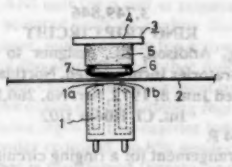
A magnetic head used for recording and reproduction in a tape recorder includes two core halves or pole pieces abutting against each other and between the core halves are formed a hard non-magnetic spacer and a void space. The core halves are designated in turn as first and second core halves as counted in the travelling direction of the tape. A wedge-shaped lip on the tape-contacting surface of the first core half extends in the travelling direction of the tape in a manner to cover the void space between the core halves.

3,749,851

TAPE-PAD FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Research, Incorporated, Tokyo, Japan

Filed July 16, 1971, Ser. No. 165,419
Claims priority, application Japan, July 28, 1970, 45/65902
Int. Cl. G11b 5/00, 5/40
U.S. Cl. 179—100.2 R 8 Claims



The present invention relates to tape-pad means for magnetic recording and reproducing apparatus wherein the back of the pad for pressing the tape against the magnetic head is

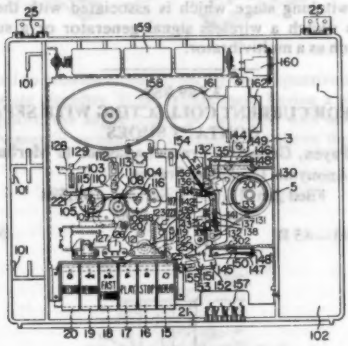
provided with a highly conductive plate, thereby decreasing the cross talk between magnetic heads adjacently arranged, by means of the eddy current flowing in the plate.

3,749,852

MAGNETIC RECORDING-REPRODUCING DEVICE

Shozo Moriya, Kawasaki; Shoji Ohta, Funabashi; Yasutaka Iwawaki, Tokyo, and Yukio Usui, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1970, Ser. No. 87,499
Claims priority, application Japan, Nov. 13, 1969, 44/91023
Int. Cl. G11b *5/00*
U.S. Cl. 179—100.2 MD **2 Claims**



A magnetic recording-reproducing device, especially applicable for educational purposes or for dictation. The device used a pre-recorded magnetic tape and an endless magnetic recording medium like an endless magnetic tape removably disposed in a cartridge, and in which information stored in the pre-recorded tape is copied on the endless magnetic recording medium. The endless magnetic recording medium having copied the information from the pre-recorded tape may be reproduced as frequently as desired, and the cartridge containing such endless magnetic recording medium may be interchangeable with another cartridge containing therein an endless magnetic recording medium of a different length in accordance with the varying length of the information to be copied. Thus, desired information may be copied on the endless recording medium and thereafter the copy of such information may be reproduced repeatedly.

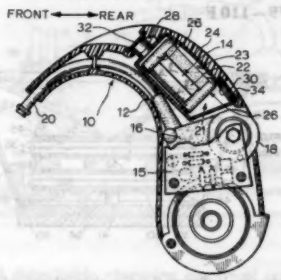
3,749,853

HEARING AID WITH DIRECTIONAL MICROPHONE SYSTEM

William G. Ely, Des Plaines, and John C. Sinclair, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed May 18, 1972, Ser. No. 254,559
Int. Cl. H04r *25/02*
U.S. Cl. 179—107 H **7 Claims**

A hearing aid is depicted which has a highly directional microphone system comprising means defining a front-to-back acoustic conduit through the hearing aid and a microphone assembly supported in acoustic isolation within the conduit in such a way as to define a sound passageway around the microphone assembly. The microphone assembly includes an acoustically sensitive diaphragm and associated electro-mechanical transduction means. A housing for the microphone assembly has a front orifice communicating exclusively with one side of the diaphragm which presents a predetermined acoustic impedance to sound waves of predetermined audible frequencies propagating in the passageway. The housing for the microphone assembly also has a rear orifice which communicates exclusively with the opposite side of the diaphragm. The rear orifice is effectively spaced from the front orifice by a predetermined acoustic path length which is such that sound waves, at least those in low and middle ranges of audible frequencies reaching opposite sides of the diaphragm through the front and rear ori-



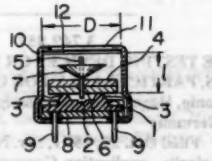
fices in the microphone housing establish a pressure gradient across the diaphragm. The rear orifice has a predetermined acoustic impedance greater than the acoustic impedance of the front orifice and of such magnitude as to produce a substantially cardioid directional characteristic for the hearing aid.

3,749,854

ULTRASONIC WAVE MICROPHONE

Hideo Mifune, Hirakata, and Kenroku Tani, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 39,214, May 21, 1970, Pat. No. 3,675,053. This application Apr. 18, 1972, Ser. No. 245,284
Claims priority, application Japan, May 26, 1969, 44/41224; June 10, 1969, 44/46665; May 26, 1969, 44/49112; June 27, 1969, 44/62368; June 27, 1969, 44/62370; Jan. 9, 1969, 44/96640
Int. Cl. H04r *17/02, 17/10*
U.S. Cl. 179—110 A **1 Claim**



An ultrasonic wave microphone which comprises a flat piezo-electric vibrator and a funnel-like appendant resonator formed of a metal having a high Q and connected to the piezo-electric vibrator at the center thereof so that electrical characteristics of the microphone can be varied, and which is especially useful for a remote control device or the like for a television set.

3,749,855

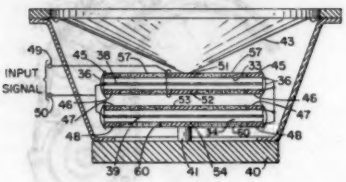
RESISTIVE ELECTRODE FOR AN ELECTROSTRICTIVE TRANSDUCER

Hugh W. Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 142,510, May 12, 1971, which is a continuation-in-part of Ser. No. 790,091, Jan. 9, 1969, abandoned. This application Sept. 7, 1972, Ser. No. 286,883

Int. Cl. H04r *17/60*

U.S. Cl. 179—110 F **8 Claims**



A transducer is formed of a thin sheet of electrostrictive material having opposing faces with electrodes disposed over the opposing faces. At least one of the electrodes has a substantial resistance measurable between a pair of spaced points on the electrode.

3,749,856

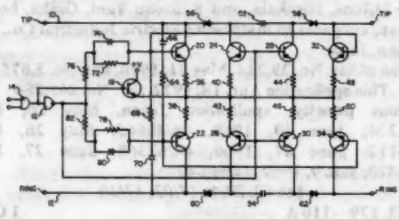
AMPLIFYING JUNCTOR CIRCUIT

Max S. MacRander, Warrenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 22, 1971, Ser. No. 200,671

Int. Cl. H04b *3/36, 3/16*

U.S. Cl. 179—170 G **7 Claims**



A junctor circuit for providing the d.c. bias current for a crosspoint network and the a.c. interconnection from the subscriber loop of a telephone system is provided with a negative impedance network to introduce bilateral gain.

3,749,857

CABLE TESTING DEVICE FOR LONG-DISTANCE CABLES, PARTICULARLY FOR OCCUPIED CABLES

Theodor Konig, Hagen, Germany, assignor to Walter Rose KG, Hagen, Germany

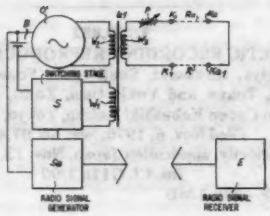
Filed Oct. 27, 1971, Ser. No. 192,924

Claims priority, application Germany, Oct. 28, 1970, P 20 52 987.7

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 **17 Claims**

A cable testing device including an oscillator designed to operate at a constant frequency and arranged to be selectively interconnected to one end of pairs of conductors in a long distance telephone cable through a transformer. Optical and/or acoustic signal generators are connected to windings on the transformer and to the pairs of conductors at their other ends at the opposite end of the cable. The signal generators permit resistance values of a known pair of conductors to be compared to resistance values of conductors tested one by one in conjunction with a return conductor of known value. These signal generators can be electrical meters or may in-



volve a switching stage which is associated with the transformer to switch a wireless signal generator or a summing device, such as a multivibrator.

3,749,858

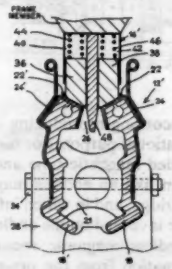
DEVICE FOR CURRENT COLLECTING WITH SEPARATE CONTACT SHOES

Jean-Pol Payen, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Jan. 11, 1971, Ser. No. 105,591

Int. Cl. B60l *5/00*

U.S. Cl. 191—45 R **5 Claims**



Current collecting device with shoes maintained in contact with feed rails wherein the contact surface is dihedral in shape to assure centering of the shoes with respect to the rails. Each shoe is divided into a pair of independent elements, each carrying one of the faces of the dihedral, to maintain contact with the rail by lateral decentering.

3,749,859

KEYBOARD SWITCH ASSEMBLY WITH IMPROVED HERMETICALLY SEALED DIAPHRAGM CONTACT STRUCTURE

Richard C. Webb; James R. Webb, both of Boulder, and Tommy N. Tyler, Broomfield, all of Colo., assignors to Colorado Instruments, Inc., Broomfield, Colo.

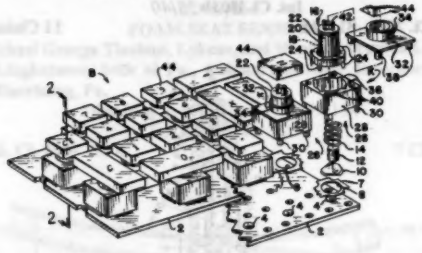
Filed Apr. 19, 1972, Ser. No. 245,577

Int. Cl. H01h *5/04, 13/52*

U.S. Cl. 200—5 R **11 Claims**

A contact key for use in a keyboard arrangement is disclosed wherein one contact extends through a circuit board and a second contact comprises a curved plate or dome spring is positioned on one side of the circuit board and is depressable so that the center thereof can come in contact with the first contact to complete a circuit. In one form of the invention the first contact comrpsies a rivet while in another form it comprises a plated-through hole to the back of the circuit board. The second contact can include a dimple at the center thereof which comes in contact with the first contact when the plate is depressed. A plurality of these first contact members are placed in a circuit board and the second contacts can be supported by a conductive support, such as a shim or plated support having apertures corresponding to the position of the first contacts. If the contact support is in the form of the shim,

it can comprise a plurality of sections interconnected by frangible tabs which are broken during assembly to separate the sections, the tabs being bent through holes in the circuit board and crimped against the back side to hold the shim in



place and to provide connections for the respective sections to appropriate circuitry. In an embodiment having a plated contact support, the support can be provided with one or more raised bosses to support the contact plate above the first contact.

ERRATUM

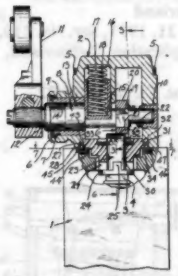
For Class 200—44 see:
Patent No. 3,749,447

3,749,860

SEALED LIMIT SWITCH

Robert G. Crepeau, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Dec. 30, 1971, Ser. No. 213,936
Int. Cl. H01h *3/16*
U.S. Cl. 200—47 **9 Claims**



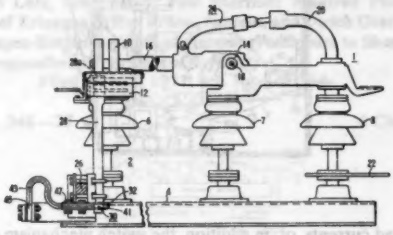
An oil tight limit switch has an operating head mountable upon a body for the switch mechanism so that an opening in the head bottom faces an opening in the top of the switch body. An intermediary member sits in the two openings to serve as a partition between the interiors of the head and the body. A rockable camshaft is journaled in the head with an outer end protruding therefrom to mount an operating lever. A cam is keyed on the inner end of the camshaft to engage a reciprocally movable cam follower that extends through the intermediary member into the interior of the switch body. Rocking of the camshaft rocks the cam to impel the cam follower downward, actuating the switch. An O-ring seal is seated in the top surface of the switch body, or alternatively in the bottom surface of the operating head, to encircle a peripheral portion of the intermediary member and seal the intermediary member with the operating head and also with the switch body.

3,749,861

DETACHABLE CLAMPING ELECTRICAL CONNECTOR

Norman Davies, Trafford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1971, Ser. No. 172,075
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 A **5 Claims**



An improved detachable clamping electrical connector is provided including a pair of spaced slotted plate portions, each having an aperture therethrough, of generally the same size and configuration as the electrical stud, to which electrical connection is desired. In one embodiment, a slotted U-shaped electrical strap member is provided, having spaced apertures therethrough, and utilized with clamping means extending through the closed end of the U-bend to clamp the furcations of the connector together and around the associated electrical stud.

In another application of the invention, separate independent spaced slotted plates are provided, each having furcations leading into accommodating apertures, which accommodate the electrical stud, to which electrical connection is desired.

Cleats and a clamping bolt are provided to urge the furcations of the separate slotted plates together to provide firm electrical engagement with the associated electrical stud.

An improved disconnecting switch, having a grounding switch associated therewith, is provided utilizing the aforesaid electrical connector.

The improved electrical connector may be associated with a terminal bushing having electrical connection thereto provided by the aforesaid detachable electrical connector.

The invention may be applied to a bus-riser attached to the main disconnecting contacts of a circuit breaker, again having the improved electrical connector attached to the primary disconnecting stud portion thereof.

The invention may be applied, importantly, to the connecting stud of a vacuum-type circuit breaker to make rigid good electrical connection therewith, either at the stationary contact end, or at the movable-contact end of the vacuum circuit breaker.

3,749,862

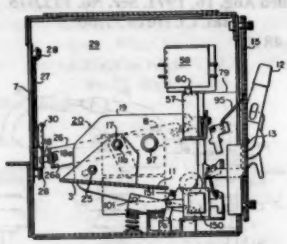
SWITCH-OPERATING MECHANISM WITH PROTECTIVE SHUTTER

John R. Wilson, Darien, and Sadig A. Shariff, Hickory Hills, both of Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 84,752, Oct. 28, 1970, Pat. No. 3,676,749.
This application Oct. 7, 1971, Ser. No. 187,435
Int. Cl. H01h *9/22*
U.S. Cl. 200—50 AA **5 Claims**

An improved switch-operating mechanism is provided for translating linear motion of an actuating member, such as a handle mechanism, for example, into the rotary motion of a tray, or other rotatable member, which may carry, for example, one or more rotatably-actuated switch members. The switch members may take the form of movable finger assemblies, which electrically connect into the circuit one or more potential transformers to energized lines. Additionally, the im-

proved switch mechanism of the present invention may be utilized for load-break switch application capable of interrupting load currents, or, in addition, the switch mechanism of the present invention may also be used for actuating non-load-breaking switch members.



3,749,863

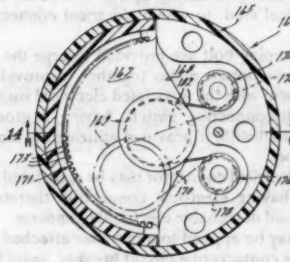
SPRING BAND BIASED MOVABLE CONTACTOR FOR HYBRID CRASH SENSOR SWITCH

Hermann Kaiser, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 30, 1971, Ser. No. 214,013

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 R **28 Claims**



A multidirectional sensor for a passive restraint system for a vehicle. The sensor includes a housing and a mass in the form of a disk located in a cavity defined within the housing. The disk is free to move in the cavity from an initial position to one of a number of actuation positions under the influence of a "g" force created in a collision situation. The sensor acts as a switch in an electrical circuit. The switch is open when the disk is in the initial position and closed when the disk is in one of the actuation positions. A spring is secured to the disk to retain the disk in the initial position and resist movement of the disk to one of the actuation positions. The spring is designed and arranged so that, in any direction of movement of the disk, the resultant or composite movement of the spring mass is in the same general direction as the movement of the disk so that the time it takes the disk to move to one actuation position is relatively equivalent to the time it takes the disk to move to any other actuation position. In the preferred embodiment, the spring comprises a thin metal band prestressed to wind upon itself; the band is wound around the periphery of the disk with its free end anchored to the housing so that the disk is normally held against a suitable backing surface by the band. In a collision situation, the disc, during movement to an actuation position, rotates and partially unwinds itself from the band.

3,749,864

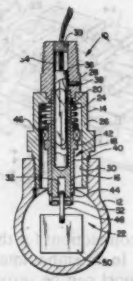
FLUID CONDITION RESPONSIVE SWITCH UNIT

Charles Tice, Plantsville, Conn., assignor to Delaval Turbine Inc., West Windsor, N.J.

Filed Feb. 28, 1972, Ser. No. 229,792

Int. Cl. H01h *35/40*

U.S. Cl. 200—81.9 M **11 Claims**



A fluid condition responsive switch comprises an elongated tubular member supporting a sleeve for limited sliding travel therealong in response to angular movement of a cam assembly pivotally supported on the member. During a portion of sleeve travel, a magnetically responsive reed switch, contained within the member, is within the effective magnetic scope of a magnet carried by the sleeve. The cam assembly includes a cam and may also include either a paddle responsive to fluid flow through an associated conduit or a float responsive to predetermined levels of fluid in an associated container.

3,749,865

TEMPERATURE RESPONSIVE CONTROL SWITCH WITH BI-METALLIC DISK MEANS

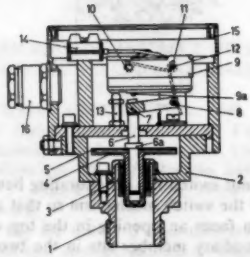
Ulrich Kalt, Lauffohr, and Rolf Kung, Nussbaumen, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 21, 1971, Ser. No. 210,526

Claims priority, application Switzerland, Feb. 24, 1971, 2640/71

Int. Cl. H01h *35/32*

U.S. Cl. 200—83 R **4 Claims**



A temperature-compensated gas density relay includes a bellows unit subjected to the gas, the pressure from which is transmitted by the bellows unit through a support mounting a bi-metallic disc and a shaft carried by the central portion of the bi-metallic, and longitudinal displacement of the shaft in response to the change in gas pressure serves to actuate the contacts of an electrical switch component of the relay. Should there be a change in the gas temperature, compensation therefor is accomplished by a temperature-induced displacement of the central portion of the bi-metallic disc, and

hence also the shaft, in a direction opposite to that caused by the change in the gas pressure resulting from that same change in temperature.

3,749,866
FOAM SEAT SENSOR

Michael George Tiazkun, Lykens, and Winfield Warren Loose, Linglestown, both of Pa., assignors to AMP Incorporated, Harrisbug, Pa.

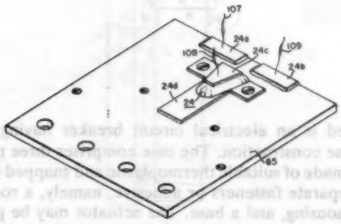
Filed May 1, 1972, Ser. No. 249,114
Int. Cl. H01h *3/02*
U.S. Cl. 200—85 A **7 Claims**

A planar, low profile switch assembly at each occupant position of a foam vehicle seat construction comprises upper and lower spaced, flexible conductive metal strips with a foam strip interposed between and separating the metal strips. Primary lances partially struck from the upper strip normally lie in the same plane as the upper strip proper but are flexed by seat occupation, the primary lances deflecting through openings in the foam strip to make contact with the lower metal strip. A plurality of longitudinally spaced secondary lances are carried at the free end of the primary lance for contact wiping and arc prevention, respectively.

3,749,867
SPACED-METALLIC-PLATE-TYPE OF ARC-CHUTE FOR A SWITCH

James O. Rexroad, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1971, Ser. No. 135,107
Int. Cl. H01h *33/12*
U.S. Cl. 200—146 R **7 Claims**



An improved spaced metallic plate-type of arc chute construction is provided for a switch, in which the spaced metallic plate structure is in close proximity to both the main separable contacts, as well as to the separable arcing contacts. In one construction, the inner edges of the spaced metallic plates are generally parallel to the one, or several main contacts of the switch, with an elongated slot provided in the central portion of the plate structure to accommodate the protruding movable tip portion of the centrally-located separable main arcing contacts.

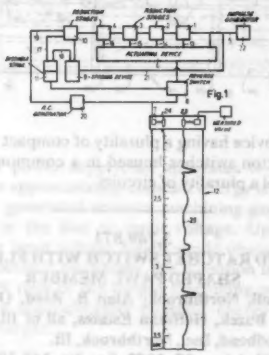
In a modification of the spaced metallic plate arc-chute structure, minor closed-end slots are, additionally, provided in the plate structure to tend to promote arc transfer movement from the separable main contacts into the spaced plate structure, to thereby provide additional cooling and deionization effects.

In a third modification of the spaced metallic plate structure of the present invention, curved minor closed-end slots are provided adjacent the main separable contact structure to additionally magnetically promote arc transfer movement from the main separable contacts into the plate structure for increased cooling and deionization effects.

3,749,868
INSCRIBING DEVICE

Herbert Lutz, Senkendorf; Paul Marhoff; Manfred Pfeiler, both of Erlangen; Klaus Frunn, Stadeln, and Ulrich Goering, Erlangen-Buchenbach, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed May 10, 1971, Ser. No. 141,764
Int. Cl. G01d
U.S. Cl. 346—23 **4 Claims**

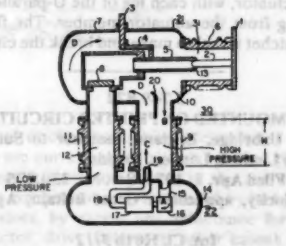


The invention is concerned with a device for inscribing a scale-like time measure upon a recording strip of an apparatus for presenting physiological measuring values. The invention is particularly characterized by the provision of a time indicator which produces equally spaced time impulses and which delivers them to the inlet of a counting chain consisting of reduction stages connected one behind the other. These stages are connected with an actuating device for the writer of an inscribing device; they supply to the actuating device actuating impulses for regulating the amplitude of the writer for a periodic group division of the time measure.

3,749,869
LIQUID-PREVENTION DEVICE FOR ARC-EXTINGUISHING GAS COMPRESSED-GAS CIRCUIT BREAKERS

Mitsumasa Imataki, Osaka, Japan, assignor to Mitsubishi Denk Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1971, Ser. No. 146,744
Int. Cl. H01h *33/57*
U.S. Cl. 200—148 B **7 Claims**



The arc-extinguishing gas of a compressed-gas circuit interrupter is prevented from liquefying by effecting the circulation of the high-pressure gas by a forced flow through a nozzle causing the gas to circulate through a heating element. The

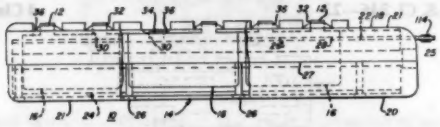
gas, for example, may comprise sulfur-hexafluoride (SF_6) gas, or other suitable arc-extinguishing gases, subject to the hazard of liquefaction.

3,749,870

ELASTOMERIC COVER FOR A PENDANT SWITCH WITH AN UNTENSIONED INTERMEDIATE POSITION

Lloyd Oakes, New Philadelphia, Ohio, assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 3, 1971, Ser. No. 195,316
Int. Cl. H01h *13/06*
U.S. Cl. 200—168 G 5 Claims



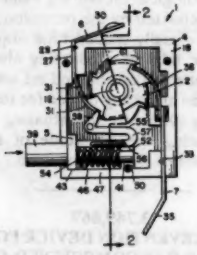
A switch device having a plurality of compact multiple position push button switches housed in a common pendant station to control a plurality of circuits.

3,749,871

PAWL AND RATCHET SWITCH WITH FLEXIBLE U-SHAPED PAWL MEMBER

Russell F. Stoll, Northbrook; Alan B. Reed, Oak Park, and Vernon T. Buzek, Hoffman Estates, all of Ill., assignors to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Apr. 27, 1972, Ser. No. 248,307
Int. Cl. H01h *13/58, 3/34*
U.S. Cl. 200—156 2 Claims



An electric switch embodying a housing having a rotatable ratchet wheel element therein, with an elongated actuator slidably mounted in the housing and projecting outwardly therefrom for rotating the element. The actuator element has a rectangular section that is guided by three walls of the casing, and a U-shaped flexible pawl member above the body portion of the actuator, with each leg of the U-parallel to a guide rod extending from the actuator member. The flexible pawl rotates the ratchet wheel to make and break the circuit.

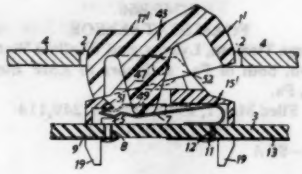
3,749,872

SWITCH MOUNTED ON PRINTED CIRCUIT BOARD

Eric Foster, Uxbridge, England, assignor to Sumlock Anita Electronics Limited, London, England

Filed Apr. 1, 1971, Ser. No. 130,275
Claims priority, application Great Britain, Apr. 1, 1970, 15,434/70
Int. Cl. H01h *3/12*
U.S. Cl. 200—166 PC 6 Claims

A switch for use with a printed circuit board has a square cover body with flexible clamps for engaging the edges of a square aperture to hold the switch casing on the board. One push button version has a spring biased button moving a guiding rod alongside a contact operating peg for depressing a contact spring mounted on the board. A pivot mounted version has a spring biased detent mechanism operating over a V-



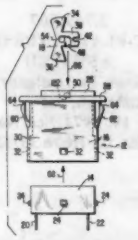
shaped ridge for holding the contact operating peg in either a closed or open switch position. The switch elements are mounted on the printed circuit board, and the casing is positioned to operate the contacts.

3,749,873

CIRCUIT BREAKER HOUSING

George S. Harper, Cambridge, and John Richard Shand, Easton, both of Md., assignors to Airpax Electronics Incorporated, Cambridge, Md.

Filed Aug. 18, 1971, Ser. No. 172,632
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 R 5 Claims



Disclosed is an electrical circuit breaker having an improved case construction. The case comprises three principal elements made of suitable thermoplastic and snapped together without separate fasteners or adhesive, namely, a rocker actuator, a housing, and a base. The actuator may be provided with a light and one or more of the plastic elements may be suitably colored. A removable auxiliary terminal plug is provided in the base and the terminals are retained by turned-over tabs after insertion.

3,749,874

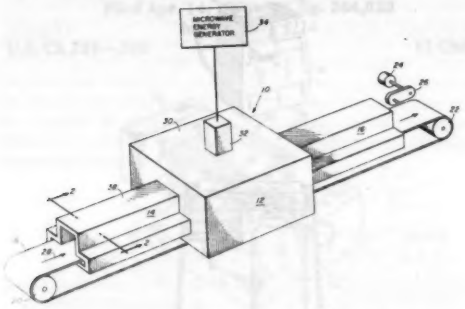
MICROWAVE APPLICATOR

Richard H. Edgar, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Ky.

Filed June 2, 1972, Ser. No. 259,333
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 3 Claims

The entrance and exit waveguide access tunnel means of a conveyorized microwave applicator are structured to accommodate the width of the conveyor belt and at the same time substantially prevent excess leakage of energy from the open ports. The cutoff frequency characteristics of the waveguide

sections are controlled to reduce energy leakage and still permit the transverse of a wide belt. The reduction of energy



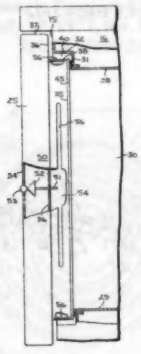
leakage is further enhanced by the provision of energy absorbing media in the access means.

3,749,875

MICROWAVE OVEN LEAKAGE DETECTION SYSTEM

Louis H. Fitzmayer, Louisville, and Nelson B. Worden, Jeffersontown, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 7, 1972, Ser. No. 278,595
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **7 Claims**



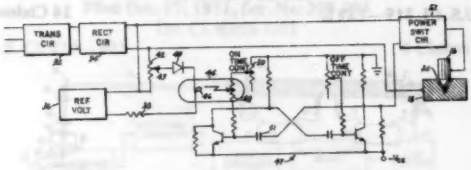
An electronic microwave oven has incorporated therewithin a leakage radiation detecting device for sensing and providing an indication of the presence of radiation escaping from the oven cavity past the door seal. The device, located centrally within a collection cavity waveguide formed within the hollow oven door, includes an antenna probe projecting into the collection cavity waveguide coupled with the appropriate amplification circuitry and a neon lamp. Elongated coupling slots are provided on each side of the door located in the channel-like area external to the door seal, each slot having a length of approximately one-half the wavelength of the operating frequency of the microwave oven. Any microwave radiation escaping past the door seal is coupled through the slots into the radiation collection cavity within the door and is sensed by the antenna probe. The amplification circuitry is set to cause the neon lamp to be activated when the radiation at the antenna probe reaches a predetermined level.

3,749,876

REGULATOR FOR AN EDM POWER SUPPLY

Harry D. Kauffman, Cincinnati, Ohio, assignor to Cincinnati Malacron Inc., Cincinnati, Ohio

Filed Apr. 24, 1972, Ser. No. 247,190
Int. Cl. B23p 1/08
U.S. Cl. 219—69 C **4 Claims**



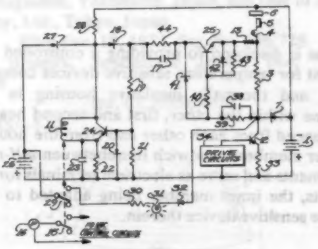
In an EDM power supply, an apparatus is provided for maintaining an approximately constant energy level in electrical discharges generated across a machining gap in response to variations in the line or input voltage. Upon detecting changes in the input voltage which would change the energy level of the electrical discharges, the invention is operative to modify the ON time of the output machining pulses thereby maintaining an approximately constant energy level in the electrical discharges.

3,749,877

ELECTRICAL ARC DETECTOR

Walter Lobur, Clawson, Mich., assignor to Electronic Removal of Metals, Inc., Clawson, Mich.

Filed Jan. 11, 1972, Ser. No. 217,011
Int. Cl. B23p 1/08
U.S. Cl. 219—69 S **10 Claims**



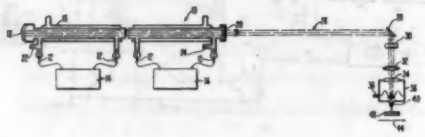
An electrical discharge machining circuit for sensing the failure of the arc current to extinguish between power pulses due to a direct current component in the arc current. The direct current component may be caused by leaky or shorted output transistors, by excess arc inductance for the power pulse duty factor, drive failure, or other causes. The direct current component causes "arc-out" damage to the workpiece and to the tool electrode. The circuit depends upon the drop-out point of a relay when the arc current duty factor approaches or includes a direct current component which component is used to oppose or cancel the relay holding current.

3,749,878

GAS ASSISTED LASER CUTTING APPARATUS

Arthur Basil Joseph Sullivan, Letchworth, and Peter Thomas Houldcroft, Royston, both of England (GB), assignors to National Research Development Corporation, London, England

Division of Ser. No. 712,782, March 13, 1968, Pat. No. 3,597,578. This application Jan. 19, 1971, Ser. No. 107,675
Claims priority, application Great Britain, Mar. 16, 1967, 12,447/67; July 31, 1967, 35,021/67; Dec. 5, 1967, 55,346/67
Int. Cl. B23k 27/00
U.S. Cl. 219—121 L 14 Claims



Apparatus for subjecting a workpiece to the action of a laser beam comprises a nozzle and optical means for directing the laser beam at the workpiece through the nozzle, together with means for directing a gas stream at the workpiece through the same nozzle.

3,749,879

APPARATUS FOR PROVIDING CONTROLLED TEMPERATURE AMBIENT

James J. Armstrong, East Providence, R.I., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Dec. 27, 1971, Ser. No. 211,901
Int. Cl. H05b 1/00
U.S. Cl. 219—210 10 Claims

Apparatus is disclosed fo providing a controlled temperature ambient for temperature sensitive devices comprising an electrically and thermally insulative housing in which is mounted one within the other, first and second heat transfer members spaced from each other and from the housing. The heat transfer members sandwich therebetween self-regulating heating elements and serve as electrical terminals for the heating elements, the inner member being adapted to receive a temperature sensitive device therein.

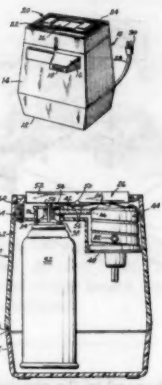
3,749,880

APPARATUS FOR HEATING FLOWABLE MATERIAL

Frederick T. Meeks, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Sept. 15, 1971, Ser. No. 180,581
Int. Cl. H05b 1/02; B67d 5/62; H05b 3/00
U.S. Cl. 219—214 4 Claims

Apparatus for heating flowable material dispensed from a pressurized container including a housing to receive the pressurized container and a hollow, double walled heat exchanger assembly having a spiral passageway between the double walls through which the material to be heated flows. Hermetically sealed inside the heat exchanger inwardly of the inner wall thereof is an electric heating element and a switch for controlling the heating element. The switch has contacts movable to a closed position by a magnet from outside the heat exchanger and automatically to an open position by a bimetal responsive to a predetermined elevated temperature inside the heat exchanger.

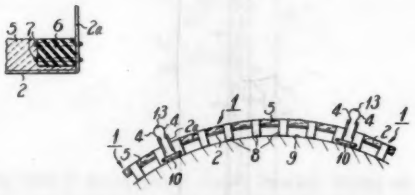


3,749,881

ELECTRIC HEATER ASSEMBLY

Yukio Tanaka, 16-19 Shimouma 4-chome, Setagaya-ku, Tokyo, Japan

Filed Dec. 2, 1971, Ser. No. 203,998
Int. Cl. H05b 3/02
U.S. Cl. 219—352 2 Claims

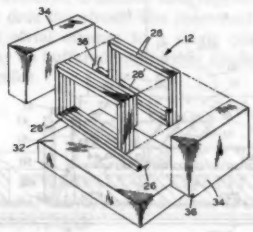


A flexible radiant heater assembly for radiantly heating a structure having a curved surface comprises a plurality of longitudinally flexible ribbon heaters juxtaposed in spaced parallel relationship. An upright piece extending upwardly at right angles to the plane of the ribbon heater is provided at each end of each heater. The heaters are electrically connected together in series by conductor wires joining the upright preces of adjacent heaters. A plurality of heat-proofing and insulating holder members extend transversely of said heaters at spaced points in the longitudinal direction thereof with each of the holder members being secured to a major face of each of the heaters. The major surface of each heater has an adiabatic fabric mounted thereon and the holder members hold the heater and fabric together by compression. The outermost ones of the holder members are secured to the upright pieces at the ends of the heaters. Legs secured at the opposite ends of each of the holder members depend vertically therefrom and extend beyond the other major surface of each of the heaters so as to hold the heaters in spaced relationship from the surface to be heated.

3,749,882
MUFFLE CONSTRUCTION

Russell T. Pilkington, Sr., Yucaipa, and Russel T. Pilkington, Jr., Calimesa, both of Calif., assignors to The J. M. Ney Company, Bloomfield, Conn.

Filed Apr. 14, 1972, Ser. No. 244,020
Int. Cl. F27b *5/14*
U.S. Cl. 219—390 **11 Claims**

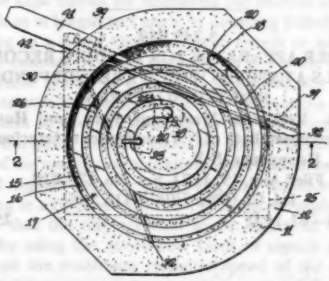


The wound wire heating element of an electrical resistance furnace muffle is enclosed within a conduit provided by a multiplicity of tubular refractory elements. Adjacent ends of the refractory elements are cooperatively configured to avoid gaps therebetween, and the refractory elements are dimensioned relative to the heating element to accommodate expansion thereof. In preferred embodiments, the heating element is fabricated from a platinum metal and the refractory elements are made of an alumina material that is substantially free from iron and its oxides.

3,749,883
ELECTRIC HEATER ASSEMBLY

Richard T. Vodvarka, and Lloyd S. Kozbelt, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed July 17, 1972, Ser. No. 272,556
Int. Cl. H05b *3/68*
U.S. Cl. 219—463 **12 Claims**

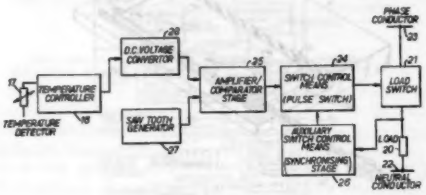


A heater assembly for use with a stove having a flat top surface. The assembly includes a base molded of integrated inorganic refractory material having opposed flat sides, the upper side being adapted to be pressed against the underside of the flat top surface. The base upper side has a recess for receiving a tubular electric heating element which is shaped to a flat spiral. A support member is formed of strip metal positioned on edge and bent to provide a pair of legs connected by a bight portion. The support member is disposed within the base recess to support the heating element and the combined thickness of the support member and the flat spiral is less than the depth of the recess so that the flat spiral is spaced from the underside of the flat top surface. The support member is devoid of any mechanical connection with the flat spiral and the base, and a single hook member is engaged over a portion of a spiral convolution and has a shank extending through a vertical opening in the base, the end of the shank being threaded to receive a nut to draw the hook member against the convolution portion and thus draw the flat spiral against the support member and the latter against the bottom of the heater.

3,749,884
SEMI-CONDUCTOR ALTERNATING CURRENT REGULATING MEANS

Walter Detmann, Niedervalluf; Gerhard Meid, Pfungstadt, and Klaus Simon, Okriftel, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 17, 1971, Ser. No. 209,194
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 **6 Claims**



The specification discloses an alternating current regulating means, for use for example in a temperature control system, by means of which an alternating current flowing in a load circuit is controlled in an ON/OFF manner in response to and in accordance with a small DC control signal such as may be provided, for example, by a process computer.

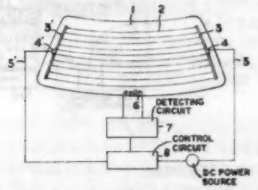
The regulating means includes a semi-conductor switching means controlled by a control means which is responsive to a converted DC control signal obtained from a signal convertor which provides electrical isolation between the DC control signal source and the switching means. The control means is also controlled so that the switching means is rendered conductive only when the AC supply voltage is of substantially zero value, and so that only an even number of half-cycles of current is passed.

The DC control signal may be of analogue or digital form, and may be provided in the latter case by electrical relay contacts.

3,749,885
DEFOGGING GLASS PLATE

Takeomi Nagasima, Yokohama, Japan, assignor to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 10, 1971, Ser. No. 206,728
Claims priority, application Japan, Dec. 18, 1970, 45/126498
Int. Cl. H05b *3/06*
U.S. Cl. 219—522 **5 Claims**



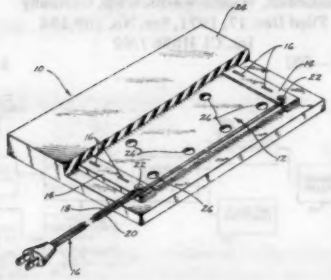
A defogging glass plate includes an electric heating element, such as being made of conductive films or electric resistance strips for electrically heating the glass plate, and a sensor having a pair of electrodes which are arranged in parallel with a suitable gap and which are fitted on the surface of the glass plate, for automatically controlling the application of heat to the glass plate depending on the cloudiness or visibility thereof.

3,749,886

ELECTRICAL HEATING PAD

Dwight W. Michaelsen, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Dec. 6, 1971, Ser. No. 204,860
Int. Cl. H05b 3/36
U.S. Cl. 219—528 1 Claim



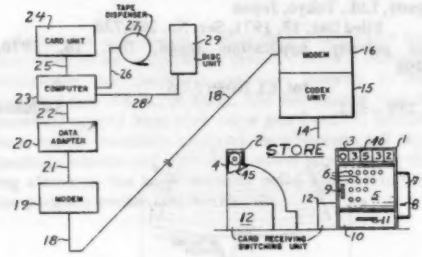
An electrically conductive sheet of flexible material includes conductive particles and channel-shaped electrodes are provided on opposite ends and are connected by lead wires to a power source. A flexible insulating envelope is bonded to and protects the conductive sheet. Holes may be provided in the conductive sheet to facilitate bonding between the protective cover and the conductive sheet. The conductive particles may be carbon and the sheet may be formed from fibrous material or rubber. The protective sheet may be molded from plastic or rubber having a very low carbon content.

3,749,887

ELECTRIC CREDIT CARD SYSTEM FOR USE WITH CASH REGISTER

Robert L. Giuliani, H5310 Akimala Place, Honolulu, Hawaii

Filed Feb. 24, 1971, Ser. No. 118,329
Int. Cl. G06k 5/00
U.S. Cl. 235—61.7 B 13 Claims



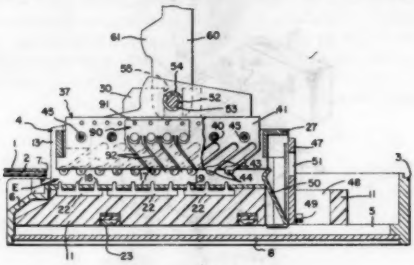
The invention is a system and method for checking and certifying personal credit cards etc. automatically at a central station by electrical means. Such electrical means is capable of transforming a message or a series of messages from a credit card or the like at a remote switching unit, and then transmitting the message to a central station where data is electrically stored as in a computer means. At the central station the message is automatically answered and the information is electrically, and automatically sent to the switching unit within a matter of seconds.

3,749,888

READ HEAD ASSEMBLY FOR CARD READER

Daniel Joseph Crowley, Steelton, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 11, 1971, Ser. No. 123,315
Int. Cl. G06r 7/06
U.S. Cl. 235—61.11 C 9 Claims



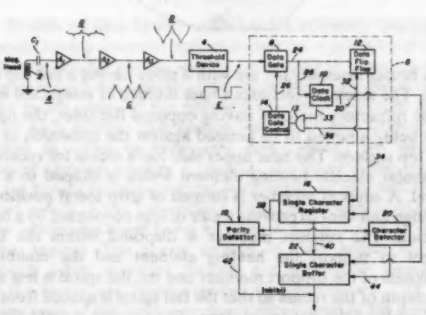
The disclosure relates to a card reader head assembly which comprises stationary and movable contact members between which is provided a card receiving area in which a data card or cards are to be disposed. The movable contact members are provided with contact fingers disposed in an insulating block with the contact members forming plate means having leg members extending outwardly at an acute angle with respect to the plate means and contact feet at the free ends of the leg members. The contact feet are disposed in alinement with respective contact elements on the stationary contact means. A holding device is provided which includes a plurality of fingers positioned on the movable contact means adjacent the contact members and sloping in a direction opposite to the contact members. Operating means is connected to the movable contact means to move same toward the stationary contact means with the edges of the contact feet wipingly engaging respective contact elements of the stationary contact means and the contact feet and leg members being movable in the same containing plate means.

3,749,889

READER APPARATUS FOR READING RECORD MATERIALS AT SPEEDS WHICH ARE INDEPENDENT OF RECORDING SPEEDS

Vygantas A. Vaskunas, Masspequa Park, and Howard K. Hager, Nesconset, both of N.Y., assignors to Interface Industries, Inc., Hauppauge, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,018
Int. Cl. G06k 7/08; G11b 5/00
U.S. Cl. 235—61.11 D 25 Claims



Variable speed reader apparatus for reproducing digital information is provided in accordance with the teachings of the present invention wherein record materials are traversed by a

reading head whose relative motion therewith may be substantially different from that at which recording took place. The resulting waveform is amplified and applied to a threshold device so that a digital representation thereof is regenerated. The regenerated waveform is then applied to a jitter compensating decoder network which acts to recover true data by deriving clocking pulses from said regenerated waveform and employing such derived clocking pulses, which jitter with the regenerated waveform, to decode such regenerated waveform to obtain true data therefrom. The recovered data may then be applied in serial manner to a single character register whereby it may be buffered and further applied to utilization apparatus therefor.

3,749,890

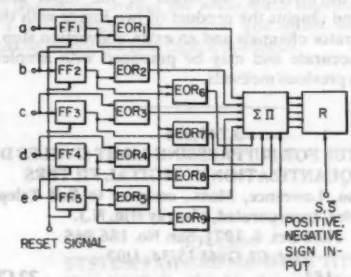
DIVISION LOGIC CIRCUIT

Shin-ichi Kamachi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 21, 1971, Ser. No. 154,796

Int. Cl. H03k *13/24*

U.S. Cl. 235—92 CP **2 Claims**



Division logic circuit for measuring the amount of displacement such as in length and angle by counting pulses each corresponding to a finely divided unit in length or angle by an electronic counter. A pulse is generated at the rise or descent of each pulse in one of a plurality of specifically quantized signals determined in relation to the variation in the amount of displacement so as to be counted by the electronic counter, and discriminating circuits generate output signals each indicative of the specific combination of the conditions of all the quantized signals thereby permitting the displacement corresponding to a finely divided unit in length or angle to be detected so that the displacement to be measured is digitally counted by using the above two kinds of signals at a speed higher than the maximum response speed of the electronic counter.

3,749,891

SAMPLED DATA CONTROL

Philip Richard Miles Burrows; Svein Hem, and Michael Peter Alwyn Terry, all of Kent, England, assignors to Reed International Limited, London, England

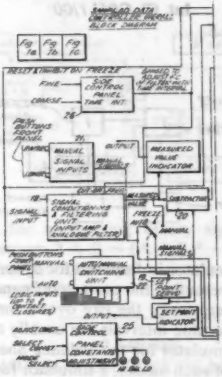
Filed Dec. 8, 1971, Ser. No. 206,049

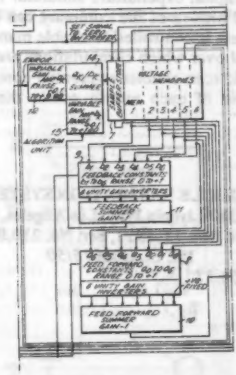
Claims priority, application Great Britain, Dec. 11, 1970, 59,064/70

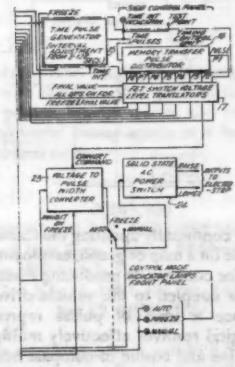
Int. Cl. G05b *21/02*

U.S. Cl. 235—150.1 **20 Claims**

A sampled data controller responsive to a derived error signal which sums the error signal with a feedback signal. A sample buffer store is arranged in response to a sampling command to sample and hold the combined error and feedback signal. A plurality of serially-connected memory stages are connected to receive the output of the sample buffer store. The feedback signal is obtained from the output of the







memory stages. The outputs of each memory stage and that of the buffer store are summed to derive a signal for adjusting a variable.

3,749,892

ACCOUNTANCY SYSTEM

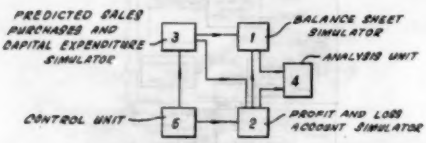
Patrick John Stenning, Belfast, Northern Ireland, assignor to Qeleg Limited, Dublin, Northern Ireland

Filed Feb. 16, 1972, Ser. No. 226,918

Claims priority, application Great Britain, Feb. 16, 1971, 4,770/71

Int. Cl. G06j 1/00

U.S. Cl. 235—150.5 7 Claims



An analogue simulator is disclosed for dynamically simulating and visually presenting the projected financial situation of a commercial enterprise or the like over a time period of 24 time intervals. The time intervals are usually months and the computer has a simulator for the Balance Sheet which is updated at the end of each month, a simulator for the Profit and Loss Account which can be programmed to show the Profit and Loss for each one month interval and a projected sales, purchases and capital expenditure simulator in which details of the projected history of the company can be entered and stored. The system is controlled to enable manual selection of the time interval over which computations are to be effected and an automatic scan enables sequential computations to be made at the end of each month within the selected time period.

3,749,893

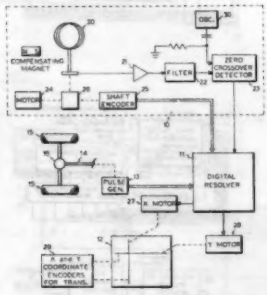
VEHICLE NAVIGATION SYSTEM

Dale Hileman, 3387 Livonia Way, Los Angeles, Calif.

Filed Dec. 22, 1971, Ser. No. 210,804

Int. Cl. G06f 15/50

U.S. Cl. 235—150.27 11 Claims



A system for continually updating the Cartesian coordinates of a land vehicle on a map or graph, employing: a compass and shaft encoder for continually producing a heading code; and a pulse generator coupled to the vehicle drive system to continually produce a train of pulses representing distance traveled. A digital resolver effectively multiplies the train of pulses by the sine and cosine of compass heading to produce two trains of pulses representing vector components of the distance traveled in a Cartesian coordinate system. These two trains are continually integrated by mechanical plotting means operated by reversible motors receiving the two trains. Encoders may be coupled to the mechanical plotting means to derive, in digital form, coordinates which may be transmitted by radio to a remote location for plotting.

3,749,894

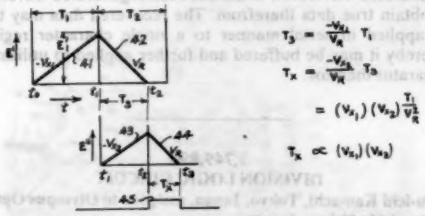
ANALOG TO DIGITAL CONVERSION AND COMPUTATION METHOD

Robert A. Avdeef, 3737 Birch St., Newport Beach, Calif.

Filed Mar. 19, 1971, Ser. No. 126,140

Int. Cl. G06g 7/16; G06j 1/00; H03k 13/02

U.S. Cl. 235—150.52 3 Claims



A method of multiplying or taking reciprocals of electrical analog quantities and converting the result to digital form. It is based on the known up/down or dual-ramp method of analog/digital conversion, which digitizes the ratio of an analog input to a reference input. The invention obtains reciprocals by inverting the order of the input and the reference, and obtains the product of two inputs with the aid of two integrator channels and an extra conversion step. The method is accurate and may be practiced with simpler apparatus than previous methods.

3,749,895

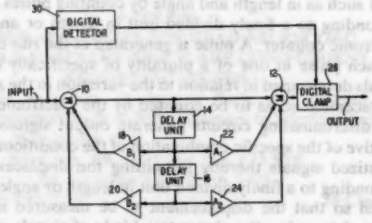
APPARATUS FOR SUPPRESSING LIMIT CYCLES DUE TO QUANTIZATION IN DIGITAL FILTERS

Chih-Yu Kao, Lawrence, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 6, 1971, Ser. No. 186,965

Int. Cl. G06f 15/34, 1/02

U.S. Cl. 235—152 22 Claims



Limit cycles due to quantization (primarily multiplication truncation or round-off), occurring in the output signal quantities of a digital filter in the presence of applied sample quantities of low magnitude, are suppressed by clamping to zero the quantities recirculating in or emanting out of the the filter, after a predetermined number of consecutively applied samples of magnitude below a predetermined threshold magnitude have been detected.

3,749,896

LEADING ZERO SUPPRESSION DISPLAY SYSTEM

Irwin Munt, Elizabeth, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

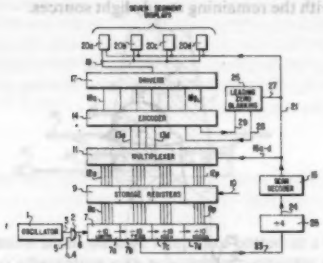
Filed Sept. 24, 1971, Ser. No. 183,374

Int. Cl. G06f 3/14

U.S. Cl. 235—152 8 Claims

An apparatus for editing information to be presented to a display to remove unwanted leading zeroes. The apparatus includes logic circuit means for accepting information about the

digit and the preceding digit and then deciding whether or not to blank the digit. If the blank decision is made the logic circuit provides an inhibit signal. The information provided to the logic includes a signal indicating that the digit be examined is or is not a zero; a signal indicating whether or not the preceding digit was blanked or that this is the first digit; and a



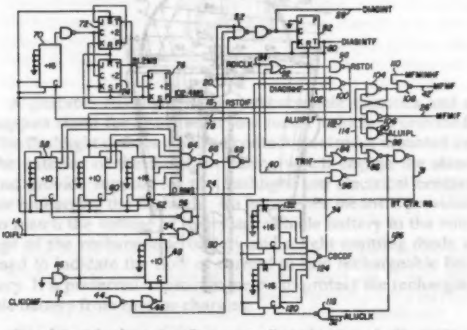
signal indicating whether the digit under examination is immediately preceded by a decimal point. The digits examined in an ordered sequence beginning with the highest ordered digit and proceeding toward the lower, each digit being examined in a well-defined time interval and either blanked or not blanked before the next digit is examined.

3,749,897

SYSTEM FAILURE MONITOR TITLE

Robert J. Hirvela, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Sept. 3, 1971, Ser. No. 177,720
Int. Cl. G06f *11/04*
U.S. Cl. 235—153 AK **8 Claims**



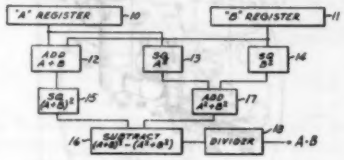
The method of and circuitry for detecting failure of a computer system. The computer system failure is detected by requiring the computer to periodically complete a diagnostic routine within a preset time and in doing so the machine must proceed through a specific number of "states." Any alteration from the prescribed time or sequence for completion of the routine will indicate a failure.

3,749,898

APPARATUS FOR MULTIPLYING BINARY SIGNALS BASED ON THE BINOMIAL THEOREM

J. Robert Logan, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 26, 1971, Ser. No. 191,985
Int. Cl. G06f *7/52*
U.S. Cl. 235—164 **14 Claims**



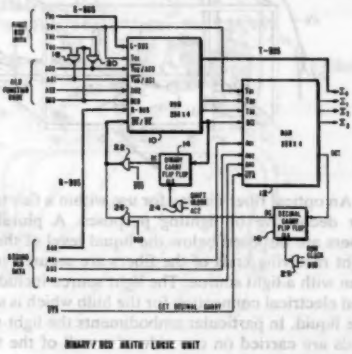
Apparatus for multiplying binary signals based on the Binomial Theorem $2AB = (A+B)^2 - (A^2+B^2)$. The apparatus utilizes accumulator and squaring techniques to minimize computer time.

3,749,899

BINARY/BCD ARITHMETIC LOGIC UNIT

Jindrich Kohoutek, and Charles W. Near, both of Loveland, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed June 15, 1972, Ser. No. 263,015
Int. Cl. G06f *7/50*
U.S. Cl. 235—176 **1 Claim**



Two integrated circuit read-only-memory packages are interconnected with flip-flops and gates to form an arithmetic logic unit for performing arithmetic and logic operations in either a one-bit serial binary mode or a four-bit parallel binary-coded-decimal mode.

3,749,900

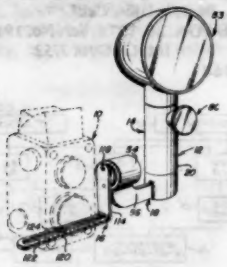
ADJUSTABLE FLASH UNIT MOUNT

Hans Jonas, and Bert Stein, both of Pittsburgh, Pa., assignors to Hans Jonas, Pittsburgh, Pa.

Filed July 13, 1971, Ser. No. 162,117
Int. Cl. B03b *15/02*
U.S. Cl. 240—1.3 **2 Claims**

A mount for attaching a flash unit to a camera including a camera mounting portion, a flash unit mounting portion and a third connecting portion connecting the camera mounting portion to the flash mounting portion. The flash mounting portion is rotatably adjustable relative to the connecting portion about a first axis and the camera mounting portion is rotatably adjustable relative to the connecting portion about a second

axis disposed at right angles relative to the first mentioned axis whereby the direction in which the flash supported from the



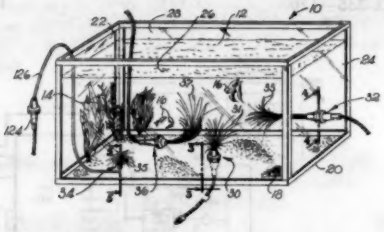
camera by the mount may be universally adjusted relative to the direction in which the associated camera faces.

3,749,901

OPTICAL FIBER DISPLAY

Douglas W. Clough, Tustin, Calif., assignor to Poly-Optics, Inc., Santa Ana, Calif.

Filed Mar. 2, 1970, Ser. No. 15,620
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **11 Claims**



An optical fiber display for use within a fish tank or the like for decorative or lighting purposes. A plurality of optical fibers are disposed below the liquid level of the tank and the light receiving ends of the fibers are secured in communication with a light source. The light source includes a light bulb and electrical connection for the bulb which is separated from the liquid. In particular embodiments the light-receiving fiber ends are carried on one side of a wall of the tank while the light bulb and electrical connection are carried on the other side of the wall.

3,749,902

SAFETY EQUIPMENT FOR RESCUE WORKERS, TRAFFIC POLICEMEN AND THE LIKE

John L. Drew, R.F.D. 1, Shinny Ln., Trenton, N.J.

Filed July 28, 1971, Ser. No. 166,875
Int. Cl. A42b *1/24*
U.S. Cl. 240—6.4 W **5 Claims**

Safety equipment is herein described for usage by rescue workers, traffic policemen and the like. The equipment includes a piece of head gear which may comprise a conventional hard hat having a continuous, horizontally extending brim disposed thereabout. The brim may be formed with bubble-like recesses opening downwardly toward the user of the head gear. White light sources may be operatively mounted within each bubble-like recess and so disposed with respect thereto that light is directed downwardly upon the user of the head gear but, is shielded from other parties having a line of vision extending generally horizontally or downwardly toward the head gear. A second light source may be operatively mounted on top of the head gear and provided with a red lens for indicating "danger." Electrical conductors may be provided to extend between a disconnectable source of electrical power and the various lights provided on the head gear. A transistorized flasher component may be connected within the circuitry, presented by the electrical conductors, and may be disposed on a negative side of the second light source in order to permit proper flashing thereof while minimizing interference with the remaining steady light sources.

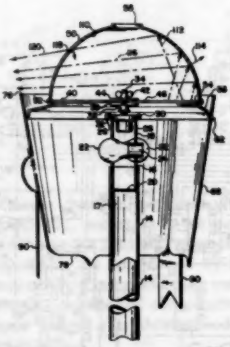
The light source on top of the hard hat may be supported by means of a tubular bolt member extending to a base portion of the light source through an aperture formed in an upper surface of the head gear. The conductors extending between that light source and the source of electromotive power may be extended through the cylindrical space defined by the tubular bolt. A clamping member may be actuated by tightening down a nut member on the tubular bolt to clampingly engage the transistorized flasher member between the clamping member and an interior surface of the hard hat.

3,749,903

PSYCHEDELIC REFLECTION DEVICE

Paul Belokin, Jr., 6919 W. 43rd St., Berwyn, Ill.

Filed May 2, 1972, Ser. No. 249,566
Int. Cl. A47g *33/16*
U.S. Cl. 240—10.1 **10 Claims**



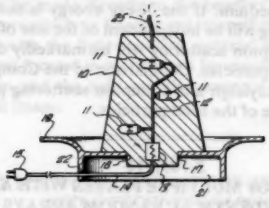
The disclosure describes a reflecting device wherein a multi-colored diaphragm or disc is positioned in relation to a transparent hemispherical dome so as to transmit light from either an internal or external source against the inside surface of the dome to form a peripheral reflected pattern which is visible primarily in the areas or plane between the diaphragm and the apex of the dome as a psychesthetic colored light pattern and unusual illumination effect. The disc and dome are rotated in relation to one another or both may rotate in relation to the light source.

3,749,904

ILLUMINATED WAX FORM AND METHOD OF MAKING SAME

Ronald A. Graff, 632 Forbes Ave., Montebello, Calif.

Filed Feb. 25, 1971, Ser. No. 118,723
Int. Cl. F21p 1/02
U.S. Cl. 240—10 B 5 Claims



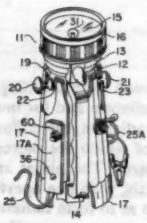
One or more small-wattage lamps are potted in a wax form of desired configuration with an exterior connector extending from the form. A resistor in series with a lamp may be internal or external of the form. The method is practiced by placing one or more lamps with individual resistors centrally in a mold with a connector exterior of the mold, pouring melted wax into the mold so as to enclose the lamp and resistor but not the connector, and removing the hardened form with the enclosed lamp and resistor from the mold. A base is then added to the form for stability and appearance.

3,749,905

RECHARGEABLE FLASHLIGHT AND SUPPORT STAND THEREFOR

Abraham Friedman, and Aaron Friedman, both of 2444 Forest Green Rd., Baltimore, Md.

Filed Sept. 22, 1972, Ser. No. 291,518
Int. Cl. F21l 7/00; H02j 7/00
U.S. Cl. 240—10.6 CH 10 Claims



A portable flashlight having rechargeable batteries and a support stand for attachment to a motor vehicle is provided. The flashlight defines a pair of contact electrodes mounted on the exterior of the flashlight casing which engage the stand and provide support for the flashlight and electrical contact for recharging the flashlight. An impedence means is provided to match the voltage of the motor vehicle battery to the voltage of the rechargeable battery and a light emitting diode is used to indicate the flow of current to said rechargeable battery. It is preferred to provide means to protect the rechargeable battery from reverse charging.

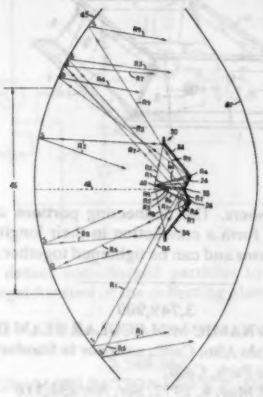
3,749,906

VEHICLE HEADLAMP SHIELD

William G. Thiry, Oley, Pa., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Mar. 13, 1972, Ser. No. 234,294
Int. Cl. F21v 11/00
U.S. Cl. 240—46.01 14 Claims

This invention relates to a shield to be used in a vehicle headlamp comprising a concave base member with curved or planar side wall sections having a channel member positioned in the central portion of the base member with the base of the channel projecting inwardly from the concave surface to prevent the direct light of the low beam filament from being projected or reflected forwardly as glare or uncontrolled light. The shield also acts to reduce and disperse the light it reflects thereby preventing excessive redirected light in unwanted regions.

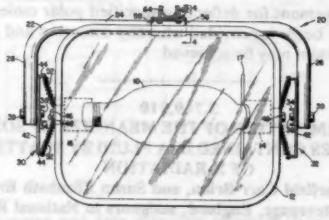


3,749,907

BULBHOLDER MOUNTING ASSEMBLY

Walter C. Allmand, Holdrege, Nebr., assignor to Allmand Bros. Inc., Holdrege, Nebr.

Filed Feb. 14, 1972, Ser. No. 225,967
Int. Cl. F21v 21/00
U.S. Cl. 240—52 R 11 Claims



A mounting assembly for a bulbholder formed by a C-shaped yoke member having spaced end arms, and a pair of spring support sub-assemblies resiliently supporting opposite ends of the bulbholder from the end arms. Each spring sub-assembly is adjustable relative to the yoke end arm so that the bulbholder may be aimed upwardly or downwardly to project the light as desired.

3,749,908

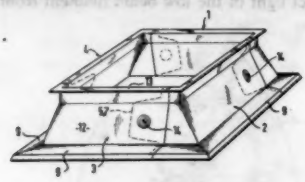
MOUNTING RIMS

Klaus Esser, Dusseldorf; Helmut Schurmann, Neuss; Alfred Heitner, Buttgen, and Norbert Hildebrandt, Geseke, all of Germany, assignors to Klaus Esser KG, Dusseldorf, Germany

Filed Nov. 12, 1970, Ser. No. 88,544
Claims priority, application Germany, Nov. 14, 1969, P 19 57 380.9
Int. Cl. F21s 3/02; B65d 7/00
U.S. Cl. 240—78 H 4 Claims

A mounting rim for light domes, ventilator frames and like structures comprises a plurality of prefabricated intercon-

nected shaped members made of heat-insulating material. Each two adjacent shaped members are connected together by co-operating connecting portions provided on the respective shaped members. The connecting portions of adjacent shaped members form a connection in their longitudinal and transverse directions and can be tightened together.

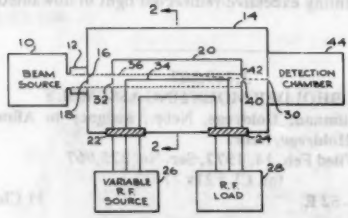


3,749,909

ELECTRO DYNAMIC MOLECULAR BEAM DEVICE

Robert M. Hill, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Mar. 6, 1972, Ser. No. 232,118
Int. Cl. G01n *27/78*
U.S. Cl. 250—41.3 **5 Claims**



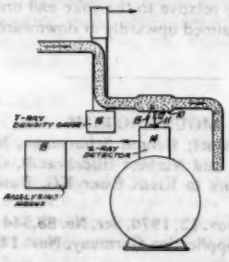
An arrangement for deflecting specified polar molecules in a molecular beam is provided whereby detection and analysis of beam content may be achieved.

3,749,910

DETERMINATION OF THE MEAN SIZE OF SOLID PARTICLES CONTAINED IN A FLUID BY SCATTERING OF X-RADIATION

Kenneth Garfield Carr-Brion, and Susan Elizabeth Bramwell, both of Stevenage, England, assignors to National Research Development Corporation, London, England

Filed Sept. 28, 1970, Ser. No. 76,065
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.50 **11 Claims**



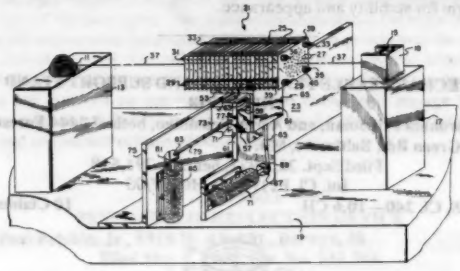
When electromagnetic radiation is passed through a heterogeneous material such as a slurry or suspension, part of the radiation will be scattered by the suspending medium and part by the solid particles contained in said medium. If, for example, the radiation used is X-radiation, and if the suspending medium consists of a relatively low atomic number material while the particles consist of a relatively high atomic number material, then due to the fundamental properties of scattered X-rays the bulk of the Compton or modified scattered X-rays will come from the suspending medium, and the Rayleigh or unmodified scattering will come both from the particles and the suspending medium. If the X-ray energy is suitable, the Rayleigh scattering will be independent of the size of the particles, but the Compton scattering will be markedly dependent on the size of the particles. Comparison of the Compton scattering or of the Rayleigh and Compton scattering provides a measure of the size of the solid particles.

3,749,911

COLLIMATOR OF MULTIPLE PLATES WITH AXIALLY ALIGNED IDENTICAL RANDOM ARRAYS OF APERTURES

Richard B. Hoover, Huntsville, Ala., and James H. Underwood, Bowie, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 30, 1970, Ser. No. 51,317
Continuation-in-part of Ser. No. 11,220, Feb. 13, 1970, abandoned.
Int. Cl. G03b *41/16*
U.S. Cl. 250—65 R **2 Claims**



A collimator is disclosed for examining the spatial location of distant sources of radiation and for imaging by projection, small, near sources of radiation, the collimator consisting of a plurality of plates, all of which are pierced with an identical random array of apertures. The plates are mounted perpendicular to a common axis, with like apertures on consecutive plates axially aligned so as to form radiation channels parallel to the common axis. For near sources the collimator is interposed between the source and a radiation detector and is translated perpendicular to the common axis so as to project radiation traveling parallel to the common axis incident to the detector. For far sources the collimator is scanned by rotating it in elevation and azimuth with a detector to determine the angular distribution of the radiation from the source.

3,749,912

SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Louis Maria De Haes, Edegem, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Continuation of Ser. No. 714,467, March 20, 1968, abandoned. This application Aug. 3, 1971, Ser. No. 168,749
Int. Cl. G01n *21/34*
U.S. Cl. 250—65 F **5 Claims**

A continuous tone transparency is produced from X-ray or radio-active radiation by means of the silver complex diffusion transfer process by exposing a light-sensitive material carrying a silver halide emulsion layer to a beam of such X-rays or radiation, treating the exposed layer with a photographic developing compound for 3–30 seconds with an aqueous developing solution having a pH between 10.5 and 11.5 at a

temperature between 25° and 35°C, bringing the light-sensitive material in the presence of a silver halide complexing agent into contact with image-receiving material including a transparent hydrophobic film support and an image-receiving layer containing development nuclei for the complexed silver halide, maintaining the two materials in contact for a period of 10–60 seconds while at a temperature between 30° and 60°C, and finally separating the materials from one another. The exposure can be made directly to the beam of X-rays or radiation or, alternatively, a fluorescent intensifying screen can be associated with the light-sensitive material whereby a visible image is first formed in such screen by exposure to the X-rays or radiation and the light-sensitive material is exposed from such visible image.

3,749,913

RENAL SCANNING COMPOSITION AND METHOD USING TECHNETIUM 99M

Samuel E. Halpern, San Diego; Manuel Tubis, and John S. Endow, Los Angeles, both of Calif., assignors to The United States of America as represented by the Administrator of the Veterans Administration, Washington, D.C.

Filed June 24, 1971, Ser. No. 156,567

Int. Cl. G01t *1/20*; A61k *27/04*

U.S. Cl. 250—71.55 **4 Claims**

A scintillation type renal scanning agent comprising reduced technetium 99m, penicillamine and acetazolamide (DIAMOX).

3,749,914

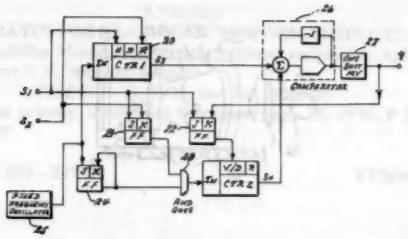
VEHICLE ATTITUDE SENSOR

Richard M. Terasaki, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 21, 1970, Ser. No. 99,951

Int. Cl. B64c *3/50*

U.S. Cl. 250—83.3 H **3 Claims**



An apparatus to control the alignment of the spin axis of a communications satellite with the major axis of an eccentric, near polar orbit. The on-board prediction of the time of apogee passage and autonomous control at apogee for the spin axis alignment with the local vertical is also provided. Thus, cumulative errors in the apogee epoch predictions due to orbital period errors are avoided.

3,749,915

SOLID STATE RADIATION DETECTOR

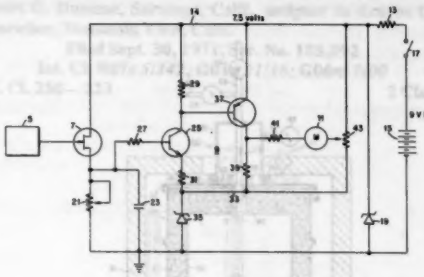
Jerry W. Hagood, and Joe Shelton, both of Huntsville, Ala., assignors to The United States of America as represented by the United States Energy Commission, Washington, D.C.

Filed Apr. 11, 1972, Ser. No. 243,365

Int. Cl. G01t *1/16*

U.S. Cl. 250—83.3 R **5 Claims**

A solid state radiation detector has been provided which does not require high voltage components. A charged particle collecting plate is connected to the gate of a field effect transistor which is followed by a DC amplifier and an indicator. The circuit uses a floating gate on the field effect transistor to provide improved sensitivity. The detector may



be used to detect non-charged particles by placing an appropriate target forward of the collecting plate.

3,749,916

PROGRAM SELECTION DEVICE, FOR USE IN PROGRAMING AUTOMATIC SCINTILLATION SPECTROMETRY

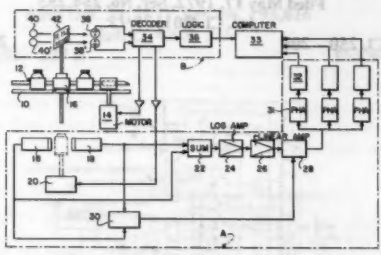
Edward W. Thomas, Morris Plains, and Edward Rapkin, Short Hills, both of N.J., assignors to Intertechnique S.A., Plaiser, France

Filed Nov. 22, 1968, Ser. No. 778,057

Claims priority, application France, Nov. 24, 1967, 67129686

Int. Cl. G01t *1/20*, *7/08*

U.S. Cl. 250—106 SC **13 Claims**



A measuring and data reduction program to be carried out on a group of samples located in successive links of a conveyor is determined by locating a program selection plug in a link in front of the group. The plug carries a coded address which is serially read as the plug is moved past the working station, decoded and used to call out one of a plurality of programs stored in an auxiliary memory for transfer into the main memory of an on-line computer integrated in the spectrometer unit.

3,749,917

DEVICE FOR ENCAPSULATING A RADIOACTIVE RESIN-WATER SLURRY

Harvey D. Kucherer, 1321 Foxwood Dr., Monroeville, Pa.

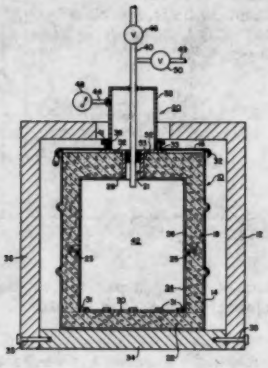
Continuation-in-part of Ser. No. 792,282, Jan. 21, 1969, abandoned. This application May 12, 1971, Ser. No. 142,788

Int. Cl. G21f *9/16*, *9/22*

U.S. Cl. 250—108 R **3 Claims**

A device and process wherein a metallic drum is lined with a layer of cement and vermiculite and evacuated. An injection

header is fitted to and extends into the hollow interior of the lined drum to permit access of radioactive waste comprising a



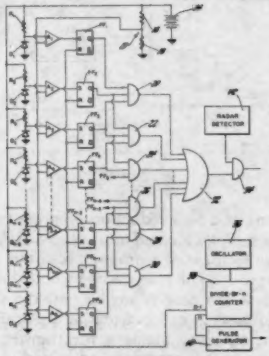
resin-water slurry. The hollow interior of the drum may fill with resins while the cement-vermiculite layer uniformly absorbs the water therefrom.

3,749,918

APPARATUS FOR DETERMINING WHEN THE SIZE OF AN OBSTACLE IN THE PATH OF A VEHICLE IS GREATER THAN A PREDETERMINED MINIMUM

Trevor O. Jones, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 17, 1972, Ser. No. 254,253
Int. Cl. H01j *39/12*
U.S. Cl. 250—208 **2 Claims**



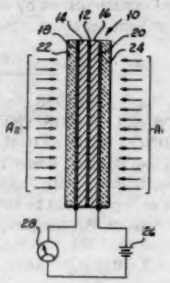
An apparatus for determinng when the size of an obstacle in the path of a vehicle is greater than a predetermined minimum including a plurality of narrow angle photosensitive detectors and laser emitters. The photosensitive detectors and laser emitters are displaced geometrically to generate a unique sensing zone for each photosensitive detector, the sensing zones being spaced one from another such that the distances there-between are representative of an obstacle of interest when the obstacle spans a predetermined number of sensing zones. The outputs of the photosensitive detectors are monitored and when the obstacle spans the predetermined number of sensing zones, an output is generated to provide an indication that the size of the obstacle is greater than the predetermined minimum.

3,749,919

IMAGE CORRELATING DEVICE COMPRISING PLURAL PHOTOCONDUCTIVE LAYERS

Thomas D. Kegelman, Ridgefield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 859,540, Sept. 19, 1969, Pat. No. 3,668,389. This application Nov. 1, 1971, Ser. No. 194,604
Int. Cl. H01j *39/06*
U.S. Cl. 250—213 R **1 Claim**



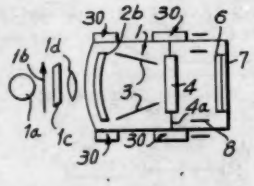
My invention relates to an image correlating device for determining the identity between two images and more particularly to a device which provides a measure of the correlation or lack of it between two images being compared.

3,749,920

SYSTEM FOR X-RAY IMAGE INTENSIFICATION

Edward Emanuel Sheldon, 30 E. 40th St., New York, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,462
Int. Cl. H01j *1/62, 31/50, 39/12*
U.S. Cl. 250—213 VT **16 Claims**



This invention relates to a system of X-ray image intensification characterized by the use of an image intensifier provided with a novel electron multiplying membrane which produces a very high intensification of the original image and which has the construction preventing the back-scatter of reflected light. This system permits to eliminate or to reduce the use of electron-optical demagnification used in present X-ray image intensifiers, and to improve thereby contrast and resolution of intensified X-ray images.

3,749,921

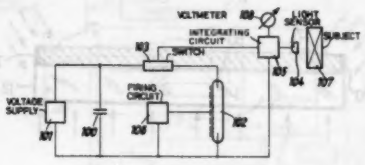
CONTROL OF ELECTRONICALLY GENERATED LIGHT PULSES

Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Ponder & Best, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application Mar. 9, 1970, Ser. No. 17,634
Claims priority, application Belgium, Mar. 7, 1969, 71104
Int. Cl. H01j *39/12*
U.S. Cl. 250—214 P **10 Claims**

Circuits and auxiliary elements for use with a device for controlling the emission of light pulses from a flash unit, which

light pulses are produced by the discharge of current pulses from a capacitor, the device including a light sensing element for receiving light produced by the flash unit and reflected from an object in the light path. One such element is constituted by light transmitting lens means having two distinct angles of acceptance extending in the same general direction and transmitting light to one or more light sensing elements. One such circuit includes two zener diodes for providing



threshold voltages for use in comparing the output of the light sensing element. Another such circuit compensates for non-linearities in the response of certain components of the device. Another such element is a special gas filled tube having an internal electrode for triggering conduction through the tube in response to a low voltage. One further element is a special gas filled tube having no internal electrode and constructed to be triggered by receipt of a light emission.

3,749,922

APPARATUS FOR READING OUT INFORMATION DATA

Louis Achilles Meeussen, Mortsel, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Sept. 24, 1971, Ser. No. 183,524

Claims priority, application Germany, Sept. 25, 1970, P 20 47 235.9

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 D **9 Claims**

Apparatus for reading out information data stored on a transparent carrier in the form of diffraction screens by means of which the individual areas of the information carrier are read out separately.

The apparatus comprises a first lens shaped as a screen plate having a plurality of spheric lens elements in the focus of each of which a source of light giving a substantial point-like beam of light can be activated and a second lens which is located behind the information carrier and which focuses the transmitted light in a plane provided with photo-electric sensing devices.

3,749,923

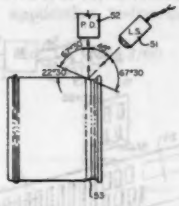
OPTICAL LABEL INSPECTING APPARATUS

Robert G. Husome, Saratoga, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Sept. 30, 1971, Ser. No. 185,092

Int. Cl. B07c *5/342*; G01n *21/16*; G06m *7/00*

U.S. Cl. 250—223 **2 Claims**



A container label inspector apparatus utilizing light reflected from the container to detect a missing or misapplied label on tin, aluminum, glass, or other reflective containers and serving to reject containers having missing or misapplied labels.

3,749,924

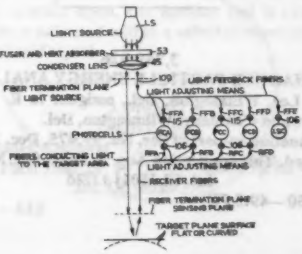
TARGET POSITION DETECTING DEVICE HAVING MEANS TO ADJUST RESPONSE OF PHOTOCELLS

George Vischulis, W172 N9409 Shady Ln., Menomonee Falls, Wis.

Filed Oct. 29, 1971, Ser. No. 193,816

Int. Cl. G02b *5/14*

U.S. Cl. 250—227 R **16 Claims**



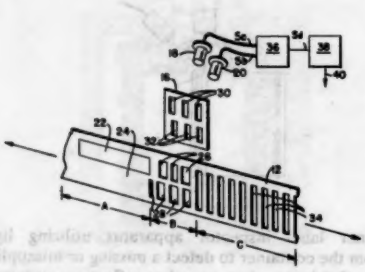
A photoelectric position detector for a line or edge target has a plurality of detector photocells and a plurality of receiver optic fiber bundles which transmit light reflected from discrete areas of the target to the detector photocells. Adjustable screw means permit selective variation of the amount of light transmitted from each receiver optic fiber bundle to the corresponding photocell. A plurality of feedback optic fiber bundles transmit light from the illumination source to the individual detector photocells, and adjusting screw means permit selective blocking of the amount of feedback light transmitted from the feedback optic fiber bundles to the detector photocells. The feedback light adjusting means and the receiver bundle light adjusting means permits the effective illumination of all of the detector photocells to be equal, and the detector photocells are connected in an electrical circuit which assures that the response of each photocell is in exact proportion to all other detector photocells, thereby enabling the outputs of the plurality of photocells to be matched, under identical conditions of target reflectivity.

3,749,925

OPTO-ELECTRONIC TRANSDUCER FOR POSITION INITIALIZATION OF A LINEAR MOTION MECHANISM

Friedrich R. Hertrich, Boulder, Colo., assignor to Iomec, Inc., Santa Clara, Calif.

Filed Dec. 1, 1971, Ser. No. 203,724
Int. Cl. H01j 5/16
U.S. Cl. 250—237 G 11 Claims



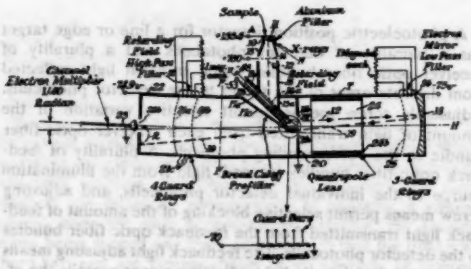
An opto-electronic transducer system for initializing the position of a linear motion mechanism such as the moving-head actuator in a magnetic disc file memory unit. A shuttering mechanism responsive to actuator movement is interposed between a light source and an aligned pair of spaced photodetectors. The shuttering mechanism comprises two relatively laterally movable elements appropriately masked to modulate the light beam received by each photodetector in such a manner that their output difference signal exhibits one or more sharply defined initial transitions through null value as the actuator reaches the initializing position. Occurrence of this reliably detectable initial zero crossing is used to generate a control signal indicating arrival of the read-write head over a predetermined radial index position on the disc at which the track count is to be started.

3,749,926

CHARGED PARTICLE ENERGY ANALYSIS

Jerald D. Lee, Wilmington, Del., assignor to E. I. duPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 99,475, Dec. 18, 1970, abandoned. This application Aug. 3, 1971, Ser. No. 168,575
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 PE 18 Claims



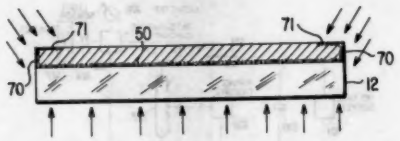
Method and apparatus for energy analysis of a stream of moving charged particles by effecting electrostatic segregation of a particle portion having a preselected kinetic energy and thereafter counting the number of the particles.

3,749,927

ELECTROSTATIC CHARGING PROCESS FOR ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Masamichi Sato; Seiji Matsumoto; Osamu Fukushima, and Satoru Honjo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 2, 1971, Ser. No. 159,363
Claims priority, application Japan, July 3, 1970, 45/58607
Int. Cl. G03g 5/00, 15/00; H01j 37/26
U.S. Cl. 250—49.5 ZC 5 Claims



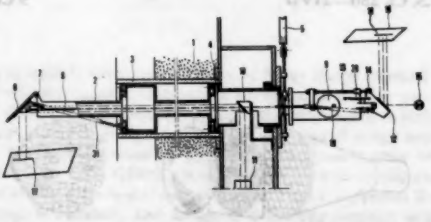
An electrostatic charging process for electrophotographic photosensitive material which comprises irradiating uniformly a photoconductive insulating layer provided on a translucent support material from the back side thereof with light absorbable by the photoconductive insulating layer thereby rendering the back surface of the photoconductive insulating layer electroconductive, simultaneously irradiating the edge portion of the photoconductive insulating layer with light absorbable by the photoconductive layer thereby forming on the edge portion an electroconductive area substantially connected with the electroconductive area formed on the back side of the photoconductive insulating layer, and applying corona discharge onto the photoconductive insulating layer keeping a grounded conductor in contact with the edge portion while the electroconductivity persists thereby supplying electrostatic charge onto the layer.

3,749,928

ALARM DEVICE USING INFRARED EMISSION FOR DETECTION AND WARNING OF HEAT BUILD-UP

Jean Jamet, 24, rue Esquirol, 75 Paris, and Louis Ponthus, 21, avenue Jean Jaures, 69 Lyon, both of France

Filed June 8, 1971, Ser. No. 150,976
Claims priority, application France, June 12, 1970, 7021686
Int. Cl. G01t 1/16
U.S. Cl. 250—347 5 Claims

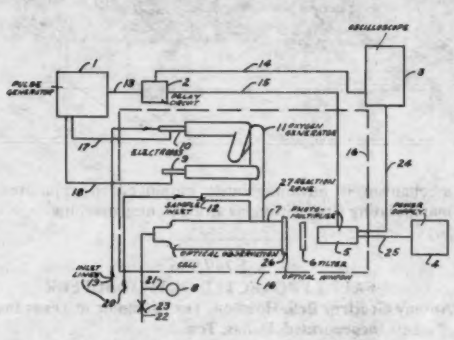


An alarm device for checking the temperature of objects placed within a shielded enclosure comprises alarm means and a unit for detecting infrared radiation including a detector which is fitted with a filtering and focusing optical system. At least one orientable mirror is placed on the one hand at one end of a rotatable cylindrical sleeve which extends through the enclosure wall and to which said mirror is attached and on the other hand symmetrically with the detector with respect to a stationary mirror, the mirrors being located in optically opposite relation within the sleeve. The orientable mirror is mounted on the sleeve and capable of pivoting about two axes which are located at right angles to each other and one of which is the axis of said sleeve. The pivotal movements correspond to trajectories of detected surfaces having the shape of a hyperbola or of a hyperbolic envelope.

3,749,929
CHEMILUMINESCENT METHOD AND APPARATUS

George W. Wooten, Centerville; Rumult Iltis, Amberly, both of Ohio, and Victor L. Johnson, Slaton, Tex., assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Oct. 7, 1971, Ser. No. 187,265
Int. Cl. H01j 39/00
U.S. Cl. 250—369 4 Claims

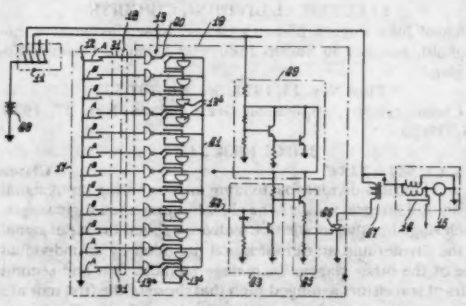


The invention is a chemiluminescent method and apparatus for detecting NO_x (NO and NO_2), SO_2, CO and other gases which react with atomic oxygen to produce chemiluminescence. Atomic oxygen generated by pulse electrical discharge is added at a controlled and known flow rate to a reaction chamber to which is also added at a controlled and known flow rate a gas mixture to be analyzed. The reaction chamber is maintained at a sufficient pressure to support chemiluminescence, normally above about 0.1 Torr and in the range of about 0.5 to 5.0 Torr. Photoelectric means is used to measure the chemiluminescence, and the photoelectric means is synchronized with the pulse discharge so that photoelectric means is turned off during the time of a pulse and for sufficient time thereafter to allow the light generated by the pulse discharge to disappear, whereby the only light the photoelectric means sees is chemiluminescence. The reaction zone and the oxygen generating means are compact and are located adjacent one another to allow miniaturization of the equipment.

3,749,930
VEHICLE THEFT SECURITY SYSTEM

Bruce Roe, P. O. Box 253, Naperville, Ill.

Filed Mar. 8, 1971, Ser. No. 121,845
Int. Cl. H02g 3/00
U.S. Cl. 307—10 AT 9 Claims

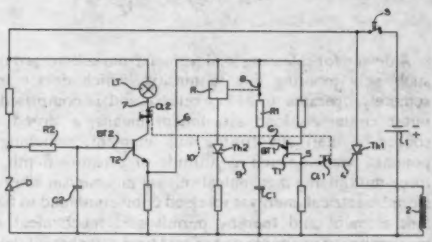


An electronic control system for the starter motor of a vehicle which includes a novel key-controlled means actuable to energize a series of gates that control the flow of electrical current from the ignition switch through related components to the starter motor switch. The system also includes lock means enabling one to render the electrical system operable in selected instances when the key is removed.

3,749,931
SAFETY DEVICE FOR AUTOMOBILE VEHICLES AND THE LIKE

Freddy Rochat, 1341 Vers-Chez-Grosjean, Vaud, Switzerland

Filed Nov. 30, 1971, Ser. No. 203,371
Claims priority, application Switzerland, Dec. 1, 1970, 17811/70
Int. Cl. H02g 3/00
U.S. Cl. 307—10 AT 6 Claims

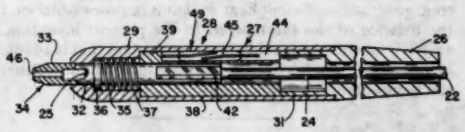


The starter switch of an automobile vehicle is series connected to the ignition coil via a thyristor, and is connected, via delay means and a second contact of coupled switch, to a monitor device for producing a perceptible signal after a variable time interval from actuating the starter switch. Said delay means simultaneously supplies the base of a transistor via an R-C time-constant, the collector-emitter lead of this transistor being connected to the control line of the thyristor via the first contact of said coupled switch. Said contacts are coupled so that when one is open, the other is closed whereby when the starter switch is actuated whilst the second contact is closed and the first contact open, the ignition coil is excited if the second switch is actuated within a selected time interval after production of said signal.

3,749,932
LIGHT PEN

Norman F. Jones, Amherst, N.H.

Filed June 29, 1972, Ser. No. 267,626
Int. Cl. G02b 5/14
U.S. Cl. 307—112 6 Claims



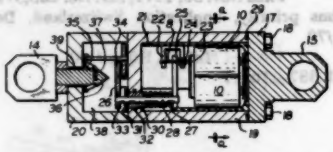
An in-put tool for transmitting light pulses to an electronic unit from a light source includes a flexible, fiber-optic, light pipe connected to the unit and having a hollow, tubular light pen affixed around the free terminal end of the pipe. The light pen has a hollow, tubular nose-piece with a hollow, tubular, spring-pressed plunger therein, the plunger tip contacting the light source and passing light therethrough to the end face of the pipe and thence to the unit. Compression of the plunger causes a magnet to energize a reed switch and close a circuit to the unit.

3,749,933

UNDERWATER RELEASE DEVICE

William M. Davidson, Box 74, Mountain Lakes, N.J.

Filed Dec. 2, 1971, Ser. No. 204,070
Int. Cl. H01h 35/00
U.S. Cl. 307—116 5 Claims



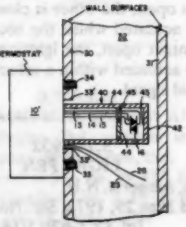
A device for releasing load tension from submerged objects, such as a mooring line in tension, which device may be remotely operated to effect release and is comprised of an outer container, load attachment means, a stored energy source, a thermally fusible link element, switching components, sensors, such as attitude or pressure depth, and a force-multiplying mechanical release mechanism wherein the stored electrical energy is released upon command to fuse said link element and thereby permit said mechanical release mechanism to uncouple one of said load-attachment devices.

3,749,934

THERMOSTAT WITH PROJECTION FOR THERMALLY ISOLATED SWITCH MEANS

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 23, 1972, Ser. No. 283,015
Int. Cl. H01h 37/12
U.S. Cl. 307—117 7 Claims



A solid state type of thermostat that utilizes a switch means, such as a triac, for control of a remote ambient temperature altering means is disclosed. The solid state switch means or triac generates sufficient heat so that it requires isolation from the balance of the thermostat. In the present invention, the switch is isolated by placing it in a projection that is adapted to be inserted through a hole in the wall upon which the thermostat is mounted.

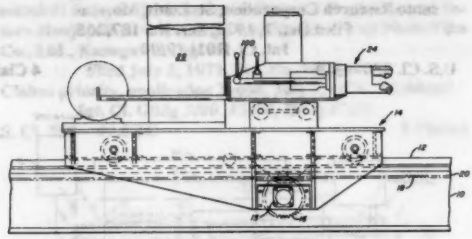
3,749,935

VARIABLE SPEED BI-DIRECTIONAL CONTROL MECHANISM

Loyal D. Warren, Birmingham, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1972, Ser. No. 233,176
Int. Cl. H02j 1/00
U.S. Cl. 307—149 5 Claims

A variable speed bi-directional control mechanism for a longitudinally movable carriage. A shaft rotatable by a handle has a centering or dead-man control, means selected by the direction of rotation of the shaft for determining the direction of movement of the carriage and means for controlling the speed of movement of the carriage. The speed of movement is determined by the amount of rotation of the shaft. The mechanism is advantageously employed in apparatus for manipulating a rail through a straightening machine.

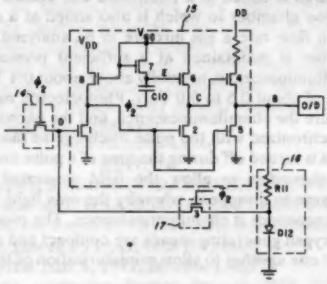


3,749,936

FAULT PROTECTED OUTPUT BUFFER

Antony Geoffrey Bell, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 19, 1971, Ser. No. 173,200
Int. Cl. H02h 7/20
U.S. Cl. 307—202 26 Claims



Disclosed is a dynamic output buffer having a fault protected output. The circuit is integrated on a monolithic chip, and the output is protected for a specific duty cycle against short circuits to both substrate ground and to a high voltage.

3,749,937

ELECTRICAL DIVIDING CIRCUITS

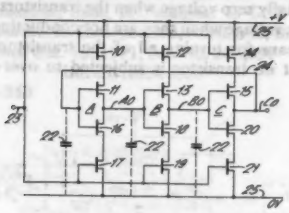
Michael John Rogers, Bishop's Cleeve, Near Cheltenham, England, assignor to Smiths Industries Limited, London, England

Filed Nov. 23, 1971, Ser. No. 201,530
Claims priority, application Great Britain, Nov. 27, 1970, 56,378/70
Int. Cl. H03k 23/08
U.S. Cl. 307—225 C 5 Claims

An electrical divider for dividing an alternating input signal by an odd integral factor N has N interconnected logic stages. Each stage has two inputs to which are applied the input signal to the divider and an output signal provided by an individual one of the other stages. Each stage includes first and second pairs of transistors arranged such that those of the first pair are biased conductive whenever the signals applied to the inputs concurrently attain a first voltage level, and those of the second pair are biased conductive whenever those voltages concurrently attain a second voltage level. When the transistors in the first or second pair of transistors are both biased conductive then the output of the stage is connected to a supply lead at the second or first voltage level respectively.

In this arrangement, the output of each stage alternates at a frequency N times less than the frequency of the input signal.

One described embodiment shows a divider for dividing by



a factor of three. The divider is formed from metal-oxide-semiconductor field effect transistor elements on a single semiconductor chip, the transistors of the first and second pairs of transistors being of complementary types.

3,749,938

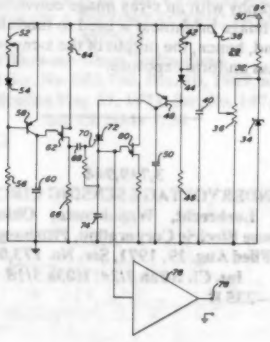
CAPACITANCE FUNCTION GENERATOR

Vernon Van Winkler, 35 Waverly Rd., Cherry Hill, N.J.

Filed Jan. 25, 1972, Ser. No. 220,636

Int. Cl. H03k *4/02*

U.S. Cl. 307—227 **4 Claims**



A capacitance function generator in which the portion of the charge on a first capacitor is transferred to a second capacitor by means of a solid state switching device. The solid state switching device may be a controlled rectifier. The charge on the first capacitor may be a linearly increasing charge supplied by a constant current generator. The controlled rectifier may be triggered periodically to produce a plurality of voltage levels across the second capacitor, each successive voltage level being greater in magnitude.

3,749,939

PHASE DIFFERENCE MEASURING DEVICE

Karel Elbert Kuijk, and Henk Hagenbeuk, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

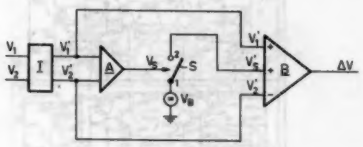
Filed Feb. 17, 1972, Ser. No. 227,165

Claims priority, application Netherlands, Mar. 13, 1972, 7103777

Int. Cl. H03d *13/00*; H03k *5/20*

U.S. Cl. 307—232 **7 Claims**

Device for measuring the phase difference between two alternating-voltage signals. These alternating-voltage signals are transformed into sawtooth voltages having equal peak-to-peak values. In an adder there is added to the difference between these sawtooth voltages a voltage which is derived from a direct-voltage supply source via a switching member which is switched at instants which correspond to the steep edges of the two sawtooth voltages, the arrangement being such that the adder delivers a direct voltage proportional to the phase



difference between the two sawtooth voltages. The invention is of particular importance for a device for generating two triangular voltages having an adjustable phase difference.

3,749,940

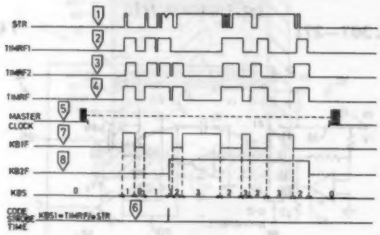
KEYBOARD STROBE FILTER FOR STATIC KEYBOARDS

Paul Diepart, Marcinelle; Philippe Gransart, Braine L'Alleud, and Gerard Maitrias, Bruxelles, all of Belgium, assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1972, Ser. No. 246,338

Int. Cl. H03k *17/00*

U.S. Cl. 307—247 A **4 Claims**



A keyboard strobe system for a static keyboard which strobes the generated code only once for a single key depression whatever the number of contact bounces or overshoots affecting a static strobe signal. The strobe pulse for each contact closure is clock-synchronized. The system comprises a digital signal processing circuit having two retriggerable delay multivibrators, two J-K flip-flops and a plurality of logic gates.

3,749,941

SIGNAL GENERATOR FOR TELEPHONE SYSTEMS

Dolamore Charles D., Sheffield Village, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

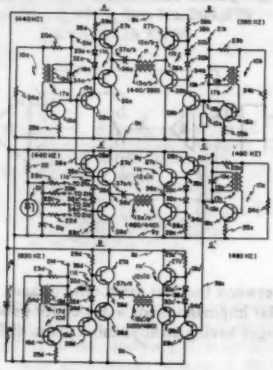
Filed Oct. 14, 1970, Ser. No. 80,584

Int. Cl. H03k *1/16*

U.S. Cl. 307—271 **7 Claims**

A signal generator circuit for producing a plurality of output signals each including two sinusoidally varying a-c voltages of different frequencies. The circuitry includes a plurality of oscillator circuits each of which operates at a predetermined, precise frequency and each of which is directly coupled to not more than two amplifiers. The outputs of predetermined pairs of amplifiers are added in series to establish the desired mixed

frequency output signals. While there is direct coupling between the oscillators and the amplifiers driven thereby, and while there is flow of a common component of current



through amplifiers which operate at different frequencies, each mixed frequency output signal is substantially free of signal distorting frequency components.

3,749,942

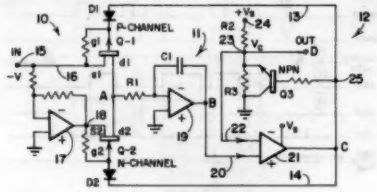
VOLTAGE TO FREQUENCY CONVERTER FOR LONG TERM DIGITAL INTEGRATION

Adrian John Moses, Newhall, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Mar. 27, 1972, Ser. No. 238,186

Int. Cl. H03k *1/16*

U.S. Cl. 307—271 **7 Claims**



A variable d.c. input voltage signal is converted to a square wave of amplitude corresponding to the voltage level of the input signal. The square wave is integrated to provide a saw tooth wave the slope of which is a function of the amplitude of the square wave. This saw tooth is compared with a fixed reference voltage and a switching signal in turn is generated when the saw tooth crosses the amplitude limits of the fixed reference voltage. The switching signal is then utilized to control the switching of the converter generating the square wave so that the frequency of the switching signal is a function of the level of the input voltage signal. This frequency may be counted and converted to a d.c. voltage to provide a long term digital integration system.

3,749,943

TRANSISTORIZED GRID PULSING CIRCUIT FOR X-RAY TUBES AND OTHER PURPOSES

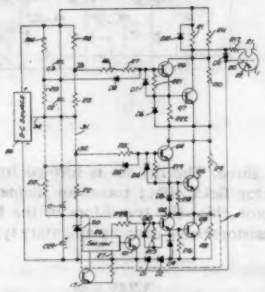
Thomas W. Lambert, Hales Corners, Wis., assignor to General Electric Company, Milwaukee, Wis.

Division of Ser. No. 801,376, Feb. 24, 1969, Pat. No. 3,567,940. This application Oct. 16, 1970, Ser. No. 81,504

Int. Cl. H03k *17/00*; H03g *1/60*

U.S. Cl. 307—311 **4 Claims**

A light-emitting diode is pulsed at a preselected rate. Emitted light is conducted through a glass image conduit to a phototransistor which operates a solid state control switch at the same rate. The solid state switch controls conduction of a series connected string of transistors whose collectors swing from essentially zero voltage when the transistors are conducting to a high voltage when they are not conducting. The circuit features means for turning all of the transistors off in such manner that no transistor is subjected to over-voltage. The



voltage pulses developed on the collector of the last transistor in the series may, for example, be applied to the grid of an x-ray tube to control its conduction intervals during high rate cinefluorography with an x-ray image converter. A signal that depends on image brightness is used to modulate the width of the pulses and, hence, the output of the x-ray tube so that each film frame has uniform exposure.

3,749,944

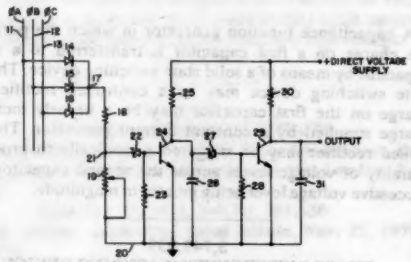
UNDERVOLTAGE SENSING CIRCUIT

Richard E. Luebrecht, Wapakoneta, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1971, Ser. No. 173,007

Int. Cl. H02h *3/24*; H03k *5/18*

U.S. Cl. 307—235 R **4 Claims**



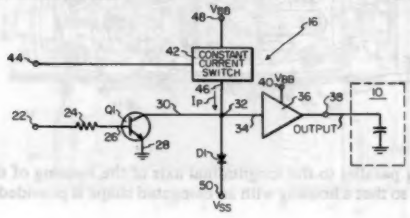
A circuit is provided to sense the occurrence of an undervoltage on any one or more phases of an AC electrical system. The phase voltages are compared with a reference level with charging of a capacitive means occurring for the duration of any undervoltage, even for part of normal phase voltage wave forms. If the level to which the capacitive means is charged exceeds another reference level, an output signal is created for indicating the undervoltage condition has existed beyond a tolerable limit. The nature of the circuit's operation is inherently frequency sensitive so that occurrence of underfrequency phase voltages is also detected.

3,749,945

CONSTANT CURRENT PULL-UP CIRCUIT FOR A MOS MEMORY DRIVER

Robert W. Ammann, Lisle, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 15, 1971, Ser. No. 208,090
Int. Cl. H03k 5/00
U.S. Cl. 307—253 8 Claims



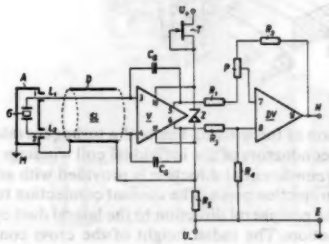
An improved driver circuit for MOS (metal oxide semiconductor) memory device including means such as constant current switch means selectively activated to supply a constant current to the MOS input during pull-up so as to decrease the pull-up current rise time.

3,749,946

ELECRICAL CIRCUIT FOR THE TRANSFERRING AND AMPLIFICATION OF A PIEZOELECTRIC TRANSDUCER SIGNAL

Jurg Von Ruti, Villars-sur-Glanf, Switzerland

Continuation of Ser. No. 883,798, Dec. 10, 1969, abandoned.
This application May 27, 1971, Ser. No. 147,684
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 7 Claims



A bipolar piezo-electric sensor is screened by a housing through which an insulated and screened bipolar lead extends. The signal lead is connected to the two signal input terminals of an amplifier circuit which is electrically insulated from ground. The amplifier circuit has two output terminals connected to the input terminals of a differential amplifier having an output terminal. In use, the difference between the symmetrical output signals of the amplifier circuit is converted into an asymmetrical signal which appears between the output terminal of the differential amplifier and ground.

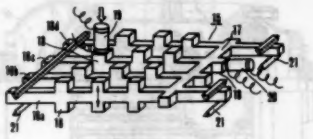
3,749,947

SWITCH DEVICES

Takehiko Kawada, and Hiroaki Takahashi, both of Yokohama, Japan, assignors to Denki Onkyo Company, Ltd., Tokyo, Japan

Filed Aug. 28, 1972, Ser. No. 284,154
Claims priority, application Japan, Aug. 28, 1971, 46/65561
Int. Cl. H04r 17/00
U.S. Cl. 310—8.3 7 Claims

A switch device comprises an elongated member made of piezoelectric material and provided with a plurality of spaced apart lateral projections and driving means connected to the member. When the driving means is excited by AC voltage it vibrates the elongated member in the longitudinal direction. The member acts to transform the longitudinal vibration into



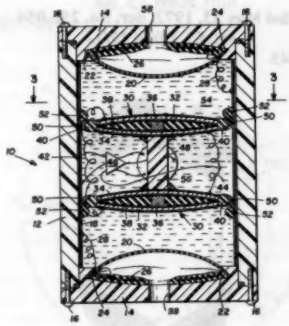
lateral vibrations in the projections. Output members are disposed to face respective projections and are selectively urged into engagement with the projections to produce output voltages.

3,749,948

PRESSURE TRANSDUCER

Harold B. Morris, Houston, Tex., assignor to Seismic Logs, Inc., Houston, Tex.

Filed June 21, 1971, Ser. No. 155,099
Int. Cl. H04r 17/00
U.S. Cl. 310—9.4 5 Claims



A pressure transducer comprises a cylindrical housing, a damping compound filling the housing and two sets of opposed dished piezoelectric crystals mounted at axially spaced points in the housing and surrounded by the compound. The adjacent crystals of the sets are rigidly interconnected and the crystals are electrically connected such that outputs caused by changes in pressure are added and outputs caused by accelerations are cancelled. Pressure waves are admitted to the housing by way of apertures formed in the ends of the housing and diaphragms extending over the apertures and contacting the damping compound.

3,749,949

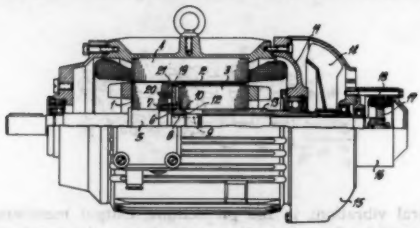
VARIABLE-SPEED ASYNCHRONOUS MOTOR WITH MULTIPLE ROTORS

Arnold Muller, Klosterstrasse 48, 7312 Kirchheim/Teck, Germany

Filed Aug. 4, 1972, Ser. No. 277,882
Claims priority, application Germany, Aug. 4, 1971, P 21 38 898.7
Int. Cl. H02k 9/06
U.S. Cl. 310—59 12 Claims

A variable-speed, multi-rotor asynchronous motor with a hollow cup-shaped intermediate rotor arranged adjacent the main rotor radially between the stator and an independently rotating ventilator rotor, where the intermediate rotor is

removably and/or axially adjustably mounted on the main drive shaft. The rotors and the stator have air passages and air



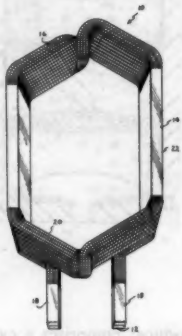
lobes for the internal cross-circulation of air; the bearing plates have openings for the entry and exit of cooling air from the ventilator.

3,749,950

DYNAMOELECTRIC MACHINE HAVING ENHANCED COOLING

Henry George Lenz, Scotia, N.Y., assignor to General Electric Company

Filed May 23, 1972, Ser. No. 256,054
Int. Cl. H02k *15/12*
U.S. Cl. 310—45 **11 Claims**



A dynamoelectric machine having preformed-coil winding conductors which are wrapped with an open weave tape that affords direct contact between liquid refrigerant circulating through the machine and the end turn portions of the conductors forming the coils. The slot portions of the winding coils preferably are wrapped with a solid dielectric tape to maximize thermal contact between the coil sides and adjacent magnetic laminations of the machiner stator.

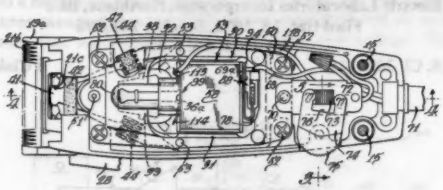
3,749,951

HAIR CLIPPER HAVING BLADE ILLUMINATION AND FIELD WIRE STRAIN RELIEF

Robert Lee Artin, and Robert Paul Petroske, both of Menomonee Falls, Wis., assignors to John Oster Manufacturing Co., Milwaukee, Wis.

Filed Apr. 29, 1971, Ser. No. 138,719
Int. Cl. H02k *11/00*
U.S. Cl. 310—73 **4 Claims**

A hair clipper having a vibratory motor with a laminated field core is formed on a plastic bobbin which has a snap-in lamp socket projecting therefrom. The vibratory motor is enclosed in a plastic housing which has a transparent panel that is positioned so that the lightbulb which is inserted in the light socket will be positioned to illuminate the cutting blades. The laminated field core is positioned with its longitudinal axis



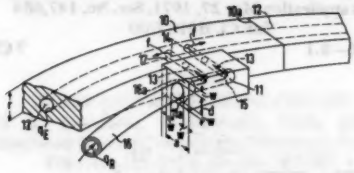
running parallel to the longitudinal axis of the housing of the clipper so that a housing with an elongated shape is provided.

3,749,952

ROTOR FOR ELECTRIC MACHINES, PARTICULARLY TURBOGENERATORS

Dietrich Lambrecht, and Erich Weghaupt, both of Mulheim-Ruhr, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim-Ruhr, Germany

Filed Oct. 4, 1971, Ser. No. 185,967
Claims priority, application Germany, Oct. 2, 1970, G 70 36 500.3
Int. Cl. H02k *9/00*
U.S. Cl. 310—54 **4 Claims**



In the region of the winding heads of a turbogenerator, each of the cross conductors of the individual coil windings extending in the circumferential direction is provided with an axially protruding projection piece. The coolant connection tubes are brought in the peripheral direction to the lateral duct openings of the projection. The radial height of the cross conductors and the axial extension of the projection pieces are in each case at least as large as the hydraulically required outer diameter of the coolant tubes including the minimum wall thickness existing in the projection piece in the vicinity of the connection end of the tube.

3,749,953

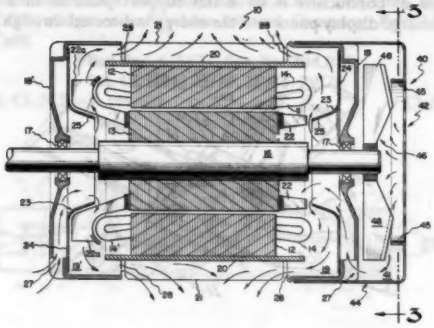
VENTILATED DYNAMOELECTRIC MACHINES

Frederick W. Baumann, Scotia, and George M. Rosenberry, Jr., Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1972, Ser. No. 228,891
Int. Cl. H02k *9/06*
U.S. Cl. 310—62 **3 Claims**

A dripproof (open ventilation) dynamoelectric machine is improved by the addition of an auxiliary fan and fan enclosure of totally enclosed design to either or both ends of the basic dripproof machine. The fan and its associated enclosure direct at least a majority of the air passing into the fan enclosure through the adjacent dripproof end shield to the end turn cavity of the dynamoelectric machine for enchanced cooling of

the stator winding end turns. After passing over the end turns, the air flow is exhausted by the end shield curvature axially



along the outer periphery of the machine to flow between a plurality of cooling fins extending outwardly from the stator frame to further cool the machine.

3,749,954

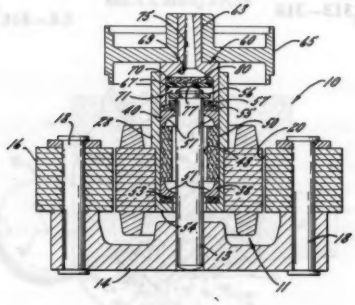
BEARING CAP FOR ELECTRIC MOTOR

Gordon R. Anderson, Jr., Roscoe, Ill., assignor to Airtrol Corporation, Rockton, Ill.

Filed Aug. 23, 1972, Ser. No. 283,190

Int. Cl. H02k *5/16*

U.S. Cl. 310—90 **9 Claims**



A unit bearing motor is provided with a vented bearing cap which allows air to escape to the atmosphere as the cap is telescoped into a bearing housing.

3,749,955

ELECTROMAGNETIC BRAKE INCORPORATED IN SPINNING OR TWISTING SPINDLES

Gustav Fetzer, Gingen, Germany, assignor to Zinser-Textilmaschinen GmbH, Ebersbach, Germany

Filed Mar. 20, 1972, Ser. No. 236,076

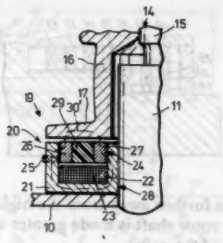
Claims priority, application Germany, Mar. 19, 1971, P 21 13 275.2

Int. Cl. H02k *49/00*

U.S. Cl. 310—93 **7 Claims**

In a spinning or twisting spindle assembly there is incorporated an electromagnetically operated brake mechanism which is formed of the following basic components:

a main member including an iron ring fixedly secured to the stationary spindle support housing and a solenoid disposed in said ring; an intermediate annular member linearly movable parallel to the spindle axis and including two annular, spaced, coaxial flux-conducting zones and an annular brake shoe member disposed between the two annular flux-conducting zones; an armature rotating with the rotary spindle part as a



unit and being frictionally engaged by the brake shoe of the intermediate member upon energization of the solenoid.

3,749,956

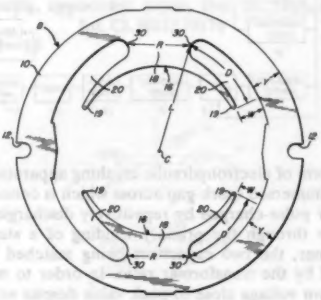
ELECTRIC MOTOR STATOR

Leon G. Reiss, Springfield, Ohio, assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed Dec. 27, 1971, Ser. No. 212,382

Int. Cl. H02k *1/06*

U.S. Cl. 310—216 **8 Claims**



A salient pole stator for an electric motor of the universal or direct current type. The stator has a field yoke area at a maximum for the flux paths and maximum slot area for windings. Thus, in consideration of the physical dimensions of a stator of this invention, greater performance characteristics and greater efficiency are possible than are possible in known salient pole stators. Thus, an electric motor of a given rating can be constructed in accordance with this invention in a smaller physical size than known motors.

3,749,957

ROTOR OF A SYNCHRONOUS NON-SALIENT-POLE MACHINE

Vitaly Arsenievich Obukhov, Ulitsa Suvarova, 34, kv. 15, and Vladimir Petrovich Glazkov, Ulitsa Festivalnaya, 16, kv. 2, both of Lysieva, U.S.S.R.

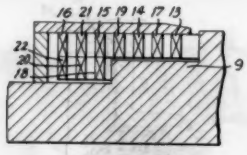
Continuation of Ser. No. 789,489, Jan. 7, 1969, abandoned. This application Jan. 25, 1971, Ser. No. 109,571

Int. Cl. H02k *1/22*

U.S. Cl. 310—265 **7 Claims**

A rotor of a synchronous non-salient-pole machine has field winding coils placed concentrically relative to high teeth into alternate slots of different depth, the coils disposed in relatively deep slots are divided in height into two parts, and the front

portions of the lower parts of the coils disposed in deep slots nearer to a high tooth are under the front portions of the coils



disposed in slots further away from the high tooth so that the diameter of the rotor shaft is made greater at the place of the shifted portions of the coils.

3,749,958

ELECTROHYDRAULIC CRUSHING APPARATUS

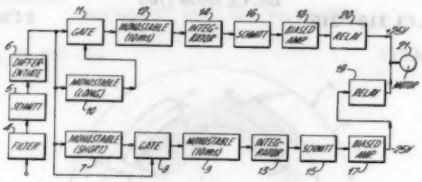
Geoffrey Marcus Ward, Reading, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 10, 1971, Ser. No. 206,748

Claims priority, application Great Britain, Dec. 30, 1970, 61,884/70

Int. Cl. B02c *19/00*

U.S. Cl. 313—146 **10 Claims**



One form of electrohydraulic crushing apparatus comprises a liquid-immersed spark-gap across which is connected a first capacitor pulse-charged by repetitively discharging a second capacitor through the primary winding of a step-up pulse-transformer, the two capacitors being matched in value as reflected by the transformer ratio. In order to maintain the breakdown voltage close to peak value despite erosion of the gap electrodes, the present invention checks that each first half-cycle of current in the transformer primary winding terminates within a predetermined time-range after the start of the half-cycle. If it terminates outside this time-range, electromechanical means are controlled to adjust the electrode gap-width so that the half-cycle terminates within this range. Because of statistical variations in the breakdown voltage, it is arranged that a substantial number of half-cycles must terminate outside the predetermined time-range before the gap-width is adjusted.

3,749,959

GAS DISCHARGE PANEL CONTAINING FLEXIBLE ELECTRICAL CONNECTIONS

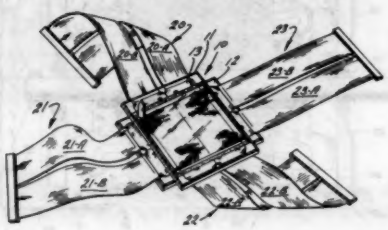
Larry J. Schmersal, and Gerald E. Wojcik, both of Toledo, Ohio, assignors to Owens-Illinois Inc., Toledo, Ohio

Division of Ser. No. 102,025, Dec. 28, 1970, which is a continuation-in-part of Ser. No. 23,236, March 27, 1970, abandoned. This application Oct. 4, 1971, Ser. No. 186,402

Int. Cl. H01j *5/58, 61/36*

U.S. Cl. 313—188 **1 Claim**

There is disclosed a multiple gaseous discharge display/memory panel having flexible electrical cable connectors integrated therewith. There is further disclosed various methods of simultaneously making individual electrical connection between pairs of closely spaced electrode conductors carried on individual panel substrates and electrical conductors carried on flexible cable substrates in which energy is applied to solder on the connecting terminal ends of the conductors so as to melt the solder and form a bond between the conductors respectively. In one particular embodiment, one of the pairs of conductors is on a flat support plate as in a gas discharge display panel and the energy is directed through the



glass substrate where it is absorbed by the conductors (on the panel substrate) to generate heat sufficient to melt the solder and form the bond. Typical solder energy sources include not by way of limitation thermal, infrared, ultrasonic, electrical, magnetic, etc. Consult the specification for further features and details.

3,749,960

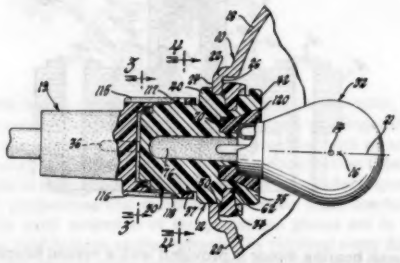
MINIATURE INCADESCENT LAMP HAVING INTEGRAL BULB AND BASE

Lloyd T. Fuqua, Fortville, and Harold E. Todd, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1971, Ser. No. 189,434

Int. Cl. H01j *5/48*

U.S. Cl. 313—318 **4 Claims**



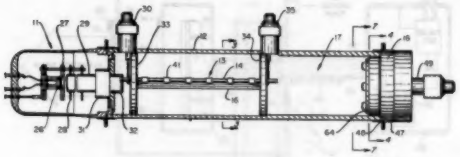
A miniature incandescent lamp having an integral bulb and base adapted for accurate frontal or rearward mounting with respect to the focal point of a reflector. The base includes axially spaced sets of radially extending locking ears and a frontal scoket having an axially projecting annular lamp support sleeve. The locking ears define first and second mounting planes having controlled positions with respect to the support sleeve. The bulb includes a filament having a controlled position with respect to an annular rim at the neck of the bulb. The rim directly engages the support sleeve to form an invariable universal connection and thereby accurately axially position the filament with respect to the mounting planes. The rim is universally adjustable about the support sleeve for accurately radially and circumferentially positioning the filament with respect to the mounting planes. A plastic cement in the socket fixedly joins the bulb to the base to maintain the radial and axial position of the filament. With this construction, the filament bears a controlled position with respect to the focal point upon seating of either of the mounting planes against the reflector.

3,749,961

ELECTRON BOMBARDED SEMICONDUCTOR DEVICE

David J. Bates, Los Altos; Aris Silzars, Redwood City, Lester A. Roberts, Palo Alto, and James A. Long, Los Altos, all of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Dec. 6, 1971, Ser. No. 204,810
Int. Cl. H01j 23/16, 29/46. 29/70
U.S. Cl. 315—3 7 Claims



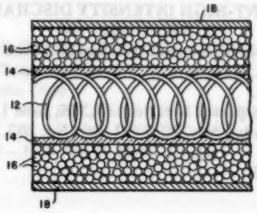
An electron bombarded semiconductor amplifier including an elongated envelope having an electron gun at one end to project an electron beam along said envelope, reverse biased semiconductor diodes forming a target at the other end of the envelope disposed to receive said beam and deflection means for deflecting the beam whereby more or less of the beam strikes the diodes forming the target.

3,749,962

TRAVELING WAVE TUBE WITH HEAT PIPE COOLING

Sidney T. Smith, and Lester M. Winslow, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1972, Ser. No. 237,676
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 5 Claims



A method and apparatus for efficiently removing heat from a traveling wave tube. A copper barrel heat sink casing is concentrically disposed about an inner glass or quartz tube with an annular space therebetween. Hollow ceramic spheres fill the space between the tube and the heat sink, and a small amount of fluid, such as a fluorocarbon serves as a vaporization agent to aid in the dissipation of the heat generated within the inner glass or quartz tube.

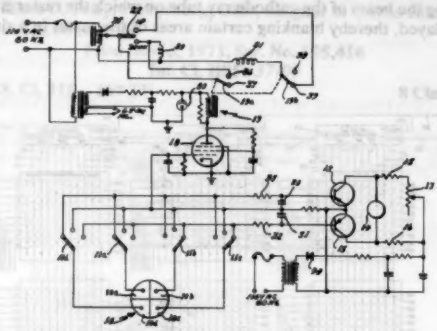
3,749,963

DEVICE TO AID IN CENTERING OF HIGH ENERGY ELECTRIC PARTICLE BEAMS IN AN EVACUATED DRIFT TUBE

Arthur R. Frederickson, Arlington; Arnold D. Morris, Braintree, and Walter B. Jackson, Waltham, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1970, Ser. No. 38,677
Int. Cl. H01j 29/70; B23k 9/00
U.S. Cl. 315—18 4 Claims

An apparatus for centering a high energy electron beam within an evacuated drift tube. An aluminum cylindrical target having mutually insulated quadrants is positioned within the tube to provide an indication of the beam position. An over-



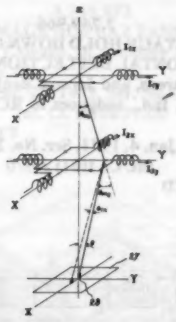
load protection circuit is provided to automatically remove the target from the tube whenever an excess current condition exists.

3,749,964

ELECTRON BEAM DEVICE

Yoshihiro Hirata, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Akishima, Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 101,613
Claims priority, application Japan, Dec. 25. 1969, 44/104540
Int. Cl. H01j 29/76
U.S. Cl. 315—18 3 Claims



An electron beam deflecting apparatus incorporating two deflecting stages, each of said deflecting stages being provided with two pairs of deflecting coils for generating two directional magnetic fields, the said fields being at right angles to each other and perpendicular to the optical axis. The electron beam deflecting apparatus also incorporates a circuit for supplying current for deflecting the electron beam, the said current supply circuit being sufficient to supply the total current required for independently actuating the individual coils constituting the two deflecting stages.

3,749,965

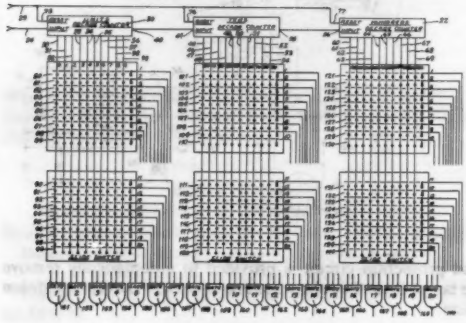
SYSTEM FOR BLANKING SELECTED AREAS OF A RASTER

Lloyd W. Bowles, Lakewood, Colo., assignor to Computer Image Corporation, Denver, Colo.

Filed Oct. 22, 1970, Ser. No. 82,942
Int. Cl. H01j 29/46
U.S. Cl. 315—22 18 Claims

This invention comprises a method and apparatus for electronically blanking selected parts of a raster. First, signals are generated, each representing a line of the raster. Selected ones of the first signals are gated to produce second signals cor-

responding to selected lines of the raster in accordance with the blanking patterns desired. Selected ones of the second signals are combined to produce third signals for de-intensifying the beam of the cathode ray tube on which the raster is displayed, thereby blanking certain areas of the raster in a single



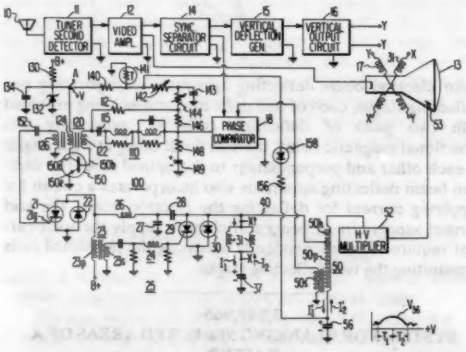
dimension. To blank areas of the raster in two dimensions delay signals are generated for modulating the beam intensity in response to other selected second signals, the widths of the delay signals being adjustable to produce blanked areas of almost any desired dimension.

3,749,966

HIGH VOLTAGE HOLD DOWN CIRCUIT FOR HORIZONTAL DEFLECTION CIRCUIT

Paul Raymond Ahrens, and Jerome Benjamin Bean, Jr., both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,713
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 TD **8 Claims**



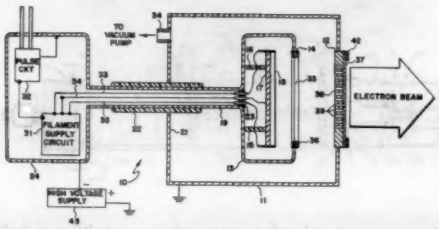
In a horizontal deflection circuit including a voltage supply for developing the kinescope high voltage, a switching diode is coupled from a capacitor in series with the flyback transformer to a control element of a voltage controlled horizontal oscillator to disable the oscillator or change its frequency to prevent the high voltage from increasing to an excessive level in the event the damper diode becomes open circuited.

3,749,967

ELECTRON BEAM DISCHARGE DEVICE

Diarmaid H. Douglas-Hamilton, Boston, and Evan R. Pugh, Lexington, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Dec. 23, 1971, Ser. No. 211,375
Int. Cl. H01j *1/52*
U.S. Cl. 315—85 **18 Claims**



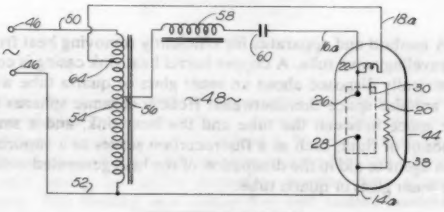
An electron beam discharge device for transmitting from the evacuated interior of the device a broad area electron beam through an electron window to a region of higher pressure outside the device. Electron emission means are disposed in an enclosure effective to shield the electron emission means from external electrical influences. Grid means at a high negative potential is disposed between the electron emission means and the electron window to effect the transmission through the electron window of electrons received from the electron emission means through the grid means. The electron window may be carried by an evacuated enclosure which may or may not be at ground potential. Space-charge limited emission together with alignment of parts insure maximum uniformity of the beam.

3,749,968

INCANDESCENT-HIGH INTENSITY DISCHARGE LAMP LIGHTING SYSTEM

Bill F. Jones, Los Angeles, and William J. Stewart, Inglewood, both of Calif., assignors to Smoot-Holman Company, Inglewood, Calif.

Continuation-in-part of Ser. No. 148,375, June 1, 1971. This application Nov. 30, 1971, Ser. No. 203,189
Int. Cl. H05b *39/00*
U.S. Cl. 315—95 **7 Claims**

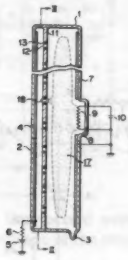


A lighting system is disclosed utilizing an improved lamp including an exterior glass envelope which is affixed to a terminal fastener, and which contains an arc tube (for providing a high intensity discharge) as well as a filament (for use in a system furnishing auxiliary incandescent illumination). The arc tube incorporates starting and primary discharge electrodes. A limiting resistor is also contained in the envelope, serially connected with the starting electrode. As disclosed, the lamp is incorporated in a system such that the incandescent filament furnishes illumination indepdendent of the arc tube. For further control, a heat-operated switch may be incorporated.

3,749,969
GAS DISCHARGE DISPLAY APPARATUS

Shoichi Miyashiro, Kazuyuki Ogawa, both of Yokohama-shi, and Horoo Hori, Kawasakishi, all of Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi Japan

Filed Feb. 3, 1971, Ser. No. 112,293
Claims priority, application Japan, Feb. 5, 1970, 45/9540
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV 20 Claims

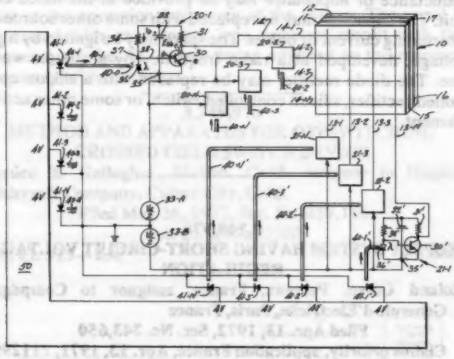


A gas disharge display apparatus including a plasma constricting member disposd between a cathode electrode and an anode electrode, said plasma constricting member having a plurality of plasma pinching holes and being associated with a scanning device for selecting one of said holes so as to concentrate said plasma in the selected hole.

3,749,970
METHOD OF OPERATING GAS DISCHARGE PANEL

Larry J. Schmersal, Toledo, Ohio, assignor to Owens-Illinois Inc., Toledo, Ohio

Filed Oct. 8, 1971, Ser. No. 187,863
Int. Cl. H03f *3/68*
U.S. Cl. 315—169 1 Claim

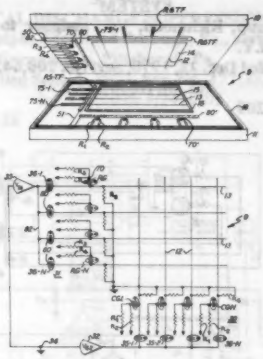


There is disclosed a method of supplying operating potentials to a gas discharge panel which comprises isolating the signal sources from any direct electrical connection with the gas discharge panel.

3,749,971
LINE ISOLATION AND ADDRESS MULTIPLEXING SYSTEM FOR GAS DISCHARGE DISPLAY MATRIX

William D. Petty, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 3, 1971, Ser. No. 195,416
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV 8 Claims

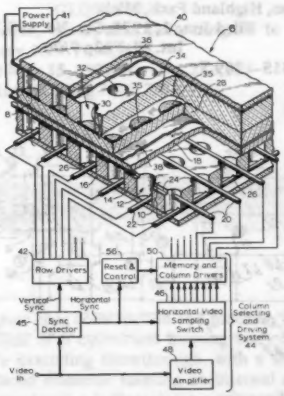


There is disclosed a line isolation and address multiplexing system for gas discharge display panels wherein gas discharge gates are used. The circuitry including the gas discharge elements for the gates may be discrete components or formed as a part of the display panel.

3,749,972
IMAGE DISPLAY PANEL

Michael C. De Jule, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 27, 1972, Ser. No. 248,322
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV 11 Claims



This disclosure depicts a video image display panel having improved light-emissive elements each comprising a first gas discharge cell which is excited by an applied video signal sample and which emits radiation in proportion to the applied signal. The photons emitted by the first cell stimulate an image intensifying stage. The image-intensifying stage includes a photoconductive element and a light-emissive gas discharge cell capable of emitting light or selected color at relatively high efficiency. In one disclosed embodiment the storage

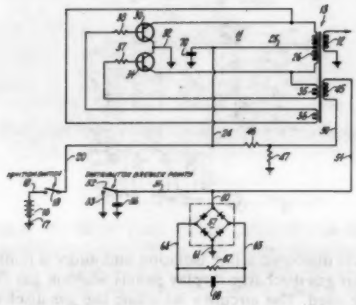
capability of the photoconductive element is maximized and augmented by storing the video signal sample which is applied to the stimulated gas discharge cell.

3,749,973

CONTINUOUS WAVE HIGH FREQUENCY IGNITION SYSTEM

Robert E. Canup, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,642
Int. Cl. H05b 37/02
U.S. Cl. 315—209 15 Claims



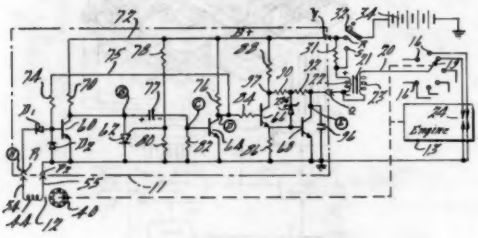
An ignition system employing a unitary magnetic circuit type of oscillator to supply continuous wave high frequency spark signals controlled by the breaker points. It has a control winding and auxiliary elements to ensure positive starting and stopping of the oscillator as required for sparking intervals.

3,749,974

ELECTRONIC IGNITION CONTROLLER

William R. Kissel, Taylor, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed June 1, 1971, Ser. No. 148,354
Int. Cl. F02p 9/00
U.S. Cl. 315—209 T 31 Claims



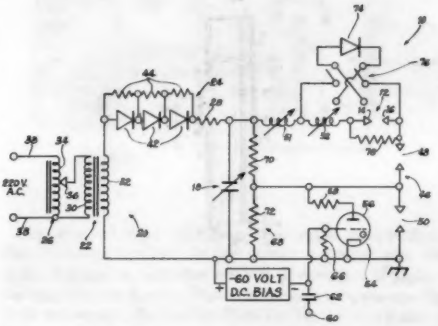
A magnetically-triggered, electronic ignition control unit, which provides an anti-dwell ignition firing period that varies inversely with engine speed. The low speed anti-dwell portion of the ignition cycle is of prolonged or sufficient duration for minimum vehicle exhaust emissions, and the high speed dwell portion of the ignition cycle is of sufficient duration for efficient charging of the high inductance, low turns ratio form of ignition coil as is employed with a breaker type ignition system.

3,749,975

ADJUSTABLE WAVEFORM SPARK SOURCE

John P. Walters, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 800,180, Feb. 18, 1969, abandoned. This application Aug. 26, 1970, Ser. No. 66,920
Int. Cl. H05b 37/00; G01j 3/30
U.S. Cl. 315—241 R 53 Claims



A capacitor is charged to a high voltage, and then is discharged through a circuit comprising an analytical spark gap and first and second inductive elements, whereby the discharge current is oscillatory. The waveform of the discharge current is modified by a diode rectifier shunted across the series combination of the analytical spark gap and the second inductive element. To provide for adjustment of the waveform over a wide range, the second inductive element is adjustable in inductance. The first inductive element is also preferably adjustable in inductance. Provision may also be made for changing the capacitance of the capacitor. A reversing switch makes it possible to reverse the polarity of the diode rectifier. One or more control spark gaps may be connected in series with the analytical spark gap. An electronic switching device may be connected across one of the control spark gaps to initiate the discharge of the capacitor. Either or both of the inductive elements may be replaced with other reactances or impedances, such as transmission lines. Coupling may be provided between the inductive elements. Inductance or impedance may be provided in the diode circuit. The capacitor may be replaced with some other source of alternating current or pulses. The spark may be ignited by high voltage, developed at a radio frequency by a quarter wave line. The diode rectifier may be replaced with a silicon controlled rectifier, silicon controlled switch, or some other active element.

3,749,976

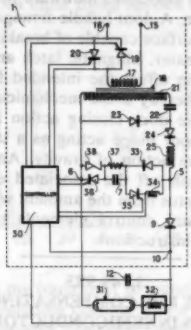
SUPPLY SYSTEM HAVING SHORT-CIRCUIT VOLTAGE REGULATION

Roland Colyn, Perreux, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Apr. 13, 1972, Ser. No. 243,650
Claims priority, application France, Apr. 13, 1971, 7112956
Int. Cl. H01s 3/09
U.S. Cl. 315—241 R 4 Claims

A first thyristor switch is turned on to supply charging current to the storage member until it is charged to a high predetermined or regulated voltage. when this voltage is reached, the first switch is turned off, and a second thyristor

switch, connected across the storage member, is turned on to short-circuit the supply system. A voltage-limiting circuit



keeps the voltage across the second switch to a value well below the high regulated voltage of the storage member.

3,749,977

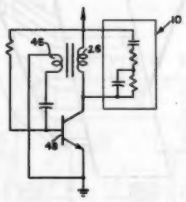
ELECTROLUMINESCENT DEVICE

Lawrence S. Sliker, Welland, Fort Erie, Canada, assignor to International Scanning Devices, Inc., Fort Erie, Canada

Filed Dec. 29, 1970, Ser. No. 102,354

Int. Cl. H01j *1/64*; H05b *43/02*

U.S. Cl. 315—276 **3 Claims**



An electroluminescent panel or sheeting requiring minimum power for acceptable brightness and including luminescent phosphors imbedded in a dielectric medium between a pair of electrodes connected to an AC source, the medium being selected to have low electrical loss as determined by the ratio of its dissipation factor to its dielectric constant at the operation frequency of the source. The panel is connected with an inductor in a resonant circuit with the frequency of the AC source being adjusted to the resonant frequency of the circuit.

3,749,978

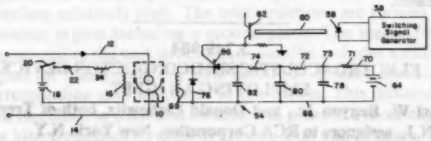
METHOD AND APPARATUS FOR OFFSWITCHING CROSSED FIELD SWITCH DEVICE

Hayden E. Gallagher, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 26, 1972, Ser. No. 257,106

Int. Cl. H05b *37/00*

U.S. Cl. 315—236 **7 Claims**



Crossed field switch device is offswitched by applying an offswitching magnetic field pulse to rapidly reduce the net magnetic field to below the critical value and to maintain the net magnetic field below the critical value for an extended period. This is accomplished by discharging parallel capacitors, the first being directly connected to the offswitching pulse coil, and the second having a time-delaying inductance connected serially therewith.

3,749,979

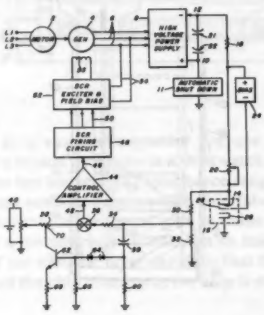
ELECTRICAL DISCHARGE SUPPRESSION CIRCUIT

Ralph G. Rudolph, Edgewood Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 2, 1971, Ser. No. 177,233

Int. Cl. H02h *3/24*, *9/02*

U.S. Cl. 317—16 **3 Claims**



A circuit to reduce the severity of high voltage transients in a regulated high voltage power supply. When an arc discharge occurs, a high voltage feedback signal is reduced to zero activating an additional circuit to reduce a feedback reference signal to zero for a predetermined time interval. With both signals at or near zero, the control circuit will not increase the high voltage power supply output until the end of the time interval.

3,749,980

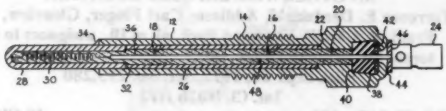
GLOW PLUG

Robert David Baxter, Shelbyville, Ind., assignor to General Electric Company, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,535

Int. Cl. F23g *7/00*, *7/06*, *7/22*

U.S. Cl. 317—98 **8 Claims**



An improved glow plug construction and product, comprising the combination of a cylindrical housing body having a central axial bore extending therethrough, with a section of said bore of reduced diameter forming an internal shoulder adjacent the terminal end; a hollow sleeve positioned in close fitting telescoping relationship within said housing bore abutting against the shoulder and extending therein a substantial length of the larger diameter bore section; and, a heater sheath containing an electrical heating element and having an end inserted within the housing bore in close fitting telescoping relationship therewith and abutting against the end of the sleeve. The heater sheath is affixed to the adjacent end of the housing by suitable bonds. An electrical conductor is connected to the heating element and extends concentrically back through the length of the sleeve and central bore of the housing, and is supported by an insulative bushing, to an outer con-

necting terminal, and the annular space within the hollow sleeve in the central bore around the conductor is packed with an appropriate electrically insulative material, such as magnesium oxide.

3,749,981

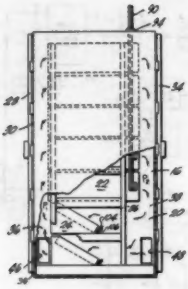
MODULAR POWER SUPPLY WITH INDIRECT WATER COOLING

Michael A. Koltuniak, Warren; Thomas N. Urquhart, and Leo L. Case, both of Troy, all of Mich., assignors to Controlled Power Corporation, Farmington, Mich.

Continuation-in-part of Ser. No. 66,266, Aug. 24, 1970, abandoned. This application Aug. 23, 1971, Ser. No. 173,955

Int. Cl. H02b 1/18

U.S. Cl. 317—100 **27 Claims**



A modular power supply for converting alternating current to direct current for high power applications wherein the power modules are mounted inside a sealed cabinet and each module has its own fans to cool transformers and rectifiers therein. Also mounted inside the cabinet are cooling modules, each of which has its own fan and heat exchanger. Hot air from the power module outlets is cooled by the cooling modules and returned to the power module inlets. The capacity of the cooling modules is selected so that substantially atmospheric pressure exists in the cabinet at the power module inlets and outlets and so that the combined air flow through the cooling modules is substantially equal to the combined air flow through the power modules.

3,749,982

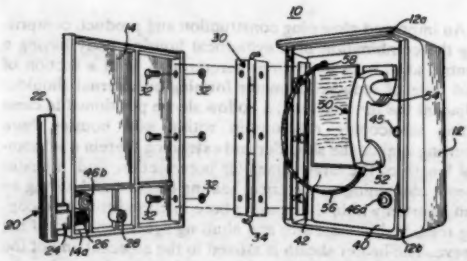
WEATHERTIGHT, VANDAL RESISTANT PROTECTIVE ENCLOSURE FOR HOUSING CIRCUIT APPARATUS IN AN OTHERWISE EXPOSED LOCATION

Terrence E. Derdzinski, Addison; Carl Finger, Glenview, and Frank R. Geradi, Elmwood Park, all of Ill., assignors to Motorola Inc., Franklin Park, Ill.

Filed Sept. 28, 1972, Ser. No. 293,280

Int. Cl. H02b 1/12

U.S. Cl. 317—120 **10 Claims**



A self-contained, weathertight, easy access, vandal resistant, protective enclosure for housing electrical/electronic apparatus in an otherwise exposed location to serve as a motorist's roadside emergency aid callbox or the like. The housing is constructed of a lightweight but high impact strength plastic material with associated hardware which is impervious to rust and corrosion. A door handle arrangement is provided having a camming surface capable of breaking ice coatings of one-half inch or greater. Magnetic latch and switching controls are included to effect the intended functions without moving parts and thereby avoid mechanical complexity and unreliability. Positive door closing action is assured by the center pin of the door hinge acting as a torsion spring and further aided by the action of gravity. An internal control panel effectively seals off the associated electrical or electronic circuit apparatus from the ambient while providing access to the necessary control elements together with appropriate operating instructions.

3,749,983

ARRANGEMENT FOR COMPENSATING PARASITIC CAPACITANCES IN SEMICONDUCTOR RECTIFIER ASSEMBLIES

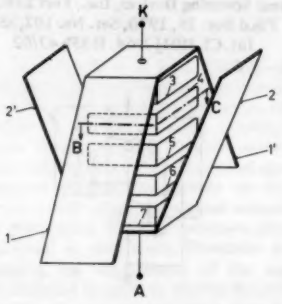
Conrad Beriger, Aarau, Switzerland, assignor to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland

Filed Mar. 10, 1972, Ser. No. 234,037

Claims priority, application Switzerland, Mar. 11, 1971, 3692/71

Int. Cl. H01l 5/00

U.S. Cl. 317—234 R **5 Claims**



A rectifier assembly is comprised of a large number of semiconductor elements of the thyristor type which are all connected together to form a single series circuit. The semiconductor elements are sub-divided into stages which are arranged in superposed relation to form a rectifier stack, each stage is comprised of two or more series connected units and each such unit is composed of a number of semiconductor elements arranged in a row. In order to compensate for parasitic capacitances which exist in the rectifier assembly, a metal screen is connected to each second junction between the rectifier units and each screen surrounds the rectifier units which are interconnected by this junction towards the outside of the rectifier stack. In addition to the metal screens, which are electrically insulated each from the other, two mutually insulated screening plates are located opposite the metal screens at the outside of the rectifier stack, one of these screening plates carrying the cathode potential of the entire rectifier stack and the other screening plate carrying the anode potential of the stack. The distance between the screening plates and the metal screens increases as the potential difference increases.

3,749,984

ELECTROACOUSTIC SEMICONDUCTOR DEVICE EMPLOYING AN IGFET

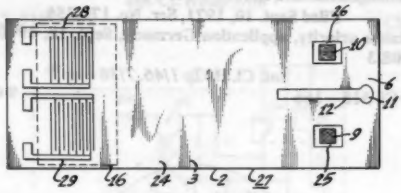
Carl W. Benyon Jr., and Donald Liebowitz, both of Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1969, Ser. No. 815,304

U.S. Cl. 317—235 R **7 Claims**

An electroacoustic semiconductor device, comprising a direct-coupled piezoelectric transducer with interdigitated

electrodes, and an insulated gate field-effect transistor fabricated on a layer of semiconductor material having a surface insulating coating, a part of which serves as the gate insulator of the transistor. An input signal applied to the interdigitated

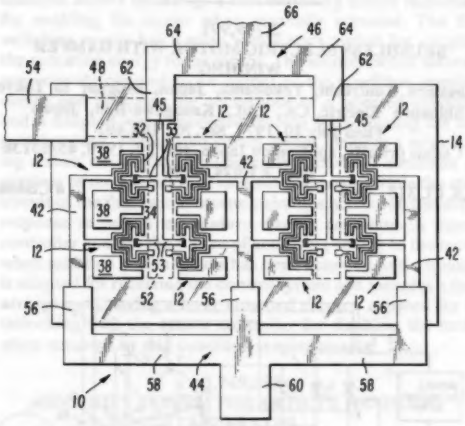


electrodes causes the transducer to launch a surface acoustic wave along the insulating coating, with a resultant change in gate electrode insulator thickness, thus controlling current flow between source and drain electrodes.

3,749,985
HIGH FREQUENCY INSULATED GATE FIELD EFFECT TRANSISTOR FOR WIDE FREQUENCY BAND OPERATION

Robert Herman Dawson, Ithaca, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 10, 1972, Ser. No. 242,390
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R 10 Claims

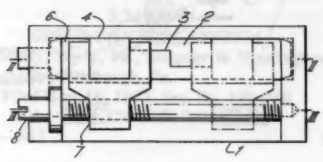


An insulated gate field effect transistor adapted for use at high frequencies, with usable gain within a broad range of frequencies, includes a plurality of dual gate MOS transistor unit structures, each with good characteristics for high frequency operation, interconnected in parallel on a single semiconductor body. The parallel combination provides a relatively high ratio of transconductance to output load capacitance and the gain bandwidth product of the device is therefore relatively high. The unit structures are formed in a substrate region including a ground plane. The means for interconnecting the unit structures in parallel includes a diffused region for connecting one gate electrode of each unit to the corresponding gate electrode of the others. This diffused region lies close to each unit structure to provide a local capacitive high frequency by-pass to ground. Low capacitance beam leads for connecting the device to external circuitry further reduce output loading capacitances.

3,749,986
VARIABLE CAPACITOR

Pierre Sauthier, Bienne, Switzerland, assignor to Omega, Louis Brandt & Frere, S. A., Bienne, Switzerland

Filed Sept. 5, 1972, Ser. No. 286,430
Claims priority, application Great Britain, Sept. 13, 1971, 42,593/71
Int. Cl. H01g *5/04*
U.S. Cl. 317—249 R 7 Claims

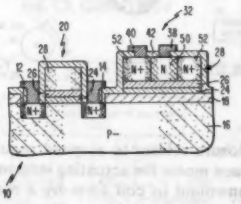


Disclosed is a variable capacitor for use in tuning the frequency of a crystal oscillator in a wristwatch. The capacitor is of small size but has a large capacitance range. It comprises a doped silicon semiconductor-oxide-chip fabricated according to MOS techniques arranged with an oxide coated surface slidable over a metallic layer formed on an insulated support. The width of the metallic layer varies so that the capacitance between it and the chip changes as the chip is moved along the layer.

3,749,987
SEMICONDUCTOR DEVICE EMBODYING FIELD EFFECT TRANSISTORS AND SCHOTTKY BARRIER DIODES

Narasipur Gundappa Anantha, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,181
Int. Cl. H01l *5/00*
U.S. Cl. 317—235 R 6 Claims

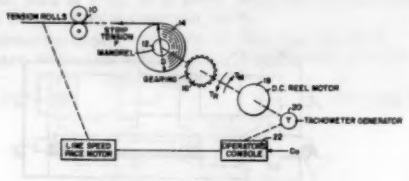


A semiconductor device having at least one FET and at least one Schottky barrier diode. The device has an FET with source and drain regions in a semiconductor body and a gate electrode. The Schottky barrier diode consists of a thin layer of polycrystalline material separated from the semiconductor body by an insulating amorphous layer, an ohmic contact, and a barrier contact. The combination is particularly useful in fabricating logic and memory devices where the Schottky barrier diode is utilized as a resistance element and/or as an input output device. In the method of producing the device, a polysilicon layer is used to fabricate both the gate electrode and the Schottky barrier diode.

3,749,988
CONSTANT TENSION CONTROL SYSTEM FOR A DC REEL DRIVE MOTOR

John Richard Pittner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1972, Ser. No. 214,808
Int. Cl. B59h *59/38*
U.S. Cl. 318—6 5 Claims

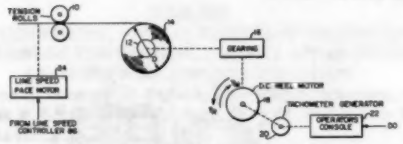


A constant tension system for a direct current reel drive motor operating to wind or unwind a coil of strip material moving at a line speed. A coil diameter signal D is derived which is a function of the instantaneous coil diameter, the coil having a finite diameter Do when the reel drive motor is at the weakest motor field setting. A motor field controller coupled to receive the coil diameter signal regulates the field flux ϕ so that when $D>Do$, ϕ is a function of D, and when D Do, ϕ is a constant. An armature current controller is coupled to receive the coil diameter signal D and to control the armature current Ia so that when $D>Do$, Ia is constant, and when D Do to enable the operator to reduce line speed so that the reel drive motor will not exceed its highest rated voltage and speed.

3,749,989
TENSION CONTROL INCLUDING MOTOR SPEED REGULATION SYSTEM

John R. Pittner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1972, Ser. No. 223,564
Int. Cl. B59h *59/38*
U.S. Cl. 318—6 4 Claims

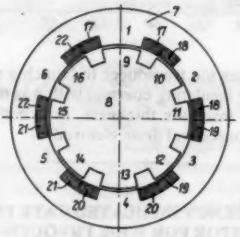


This disclosure relates to a speed regulation system for a line speed pace motor for actuating strip material that is being wound or unwound in coil form by a reel motor. Diameter signals are generated which are a function of the instantaneous coil diameter D. Using field weakening for speed control of the reel motor, the coil has a defined diameter Do when the reel motor is at weakest field. Circuitry is arranged to receive the diameter signals and deliver control signals as a function of the instantaneous diameter for all diameters D Do. A speed regulation circuit for the line speed pace motor is connected to receive dual inputs, one being a speed command or reference signal, and the other being the control signals. The speed regulation circuit then delivers a constant speed signal to the line speed pace motor when D>Do, and a progressively decreasing speed signal to the line speed pace motor for all magnitude of D Do, so that at weakest field of the reel motor, the line speed is reduced progressively as a function of the instantaneous diameter.

3,749,990
BRUSHLESS ROTARY CONVERTER FOR CONTINUOUS SPEED CONTROL AND SINGLE PHASE ALTERNATING CURRENT

Hermann Harz, 1 Berlin 13, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 10, 1971, Ser. No. 179,356
Claims priority, application Germany, Sept. 18, 1970, P 20 47 108.3
Int. Cl. H02p *1/46, 7/36*
U.S. Cl. 318—166 9 Claims

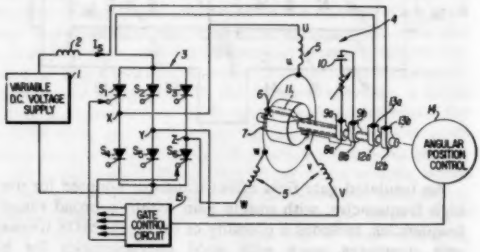


A speed-controllable brushless synchronous machine for operating with single phase alternating current has poles and pole gaps which differ in number in the stator and rotor. The pole windings of the stator poles are sequentially connected to the single phase line via thyristors when the angle of mutual overlap of the stator and rotor poles has a specific magnitude.

3,749,991
BRUSHLESS ELECTRIC MOTOR WITH DAMPER WINDING

Masateru Kuniyoshi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa-Ken, Japan

Filed July 20, 1971, Ser. No. 164,402
Claims priority, application Japan, July 20, 1970, 45/63130
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 4 Claims

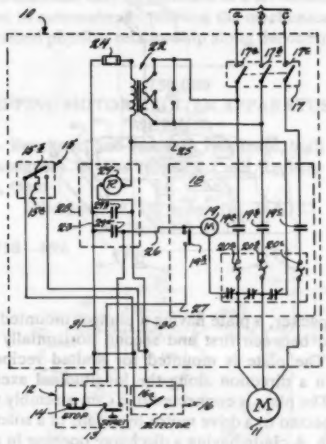


In a brushless electric motor, a static commutator including thyristors, and an angular position detector for detecting the relative angular position between an armature winding and a d.c. excited rotor are provided. The thyristors are turned on in sequence with a predetermined commutation lead angle by the signals transmitted from the angular position detector. A compensating winding is also provided in addition to a field winding and is wound on the rotor. A d.c. excitation current proportional to the armature current flows through the compensating winding to compensate the magnetomotive force resulting from the armature reaction.

3,749,992
FAN CONTROL PANEL

Emery Benjamin Jones, Jacksonville, Fla., assignor to American Coolair Corporation, Jacksonville, Fla.

Filed June 23, 1972, Ser. No. 265,508
Int. Cl. H02p 3/00
U.S. Cl. 318—452 4 Claims

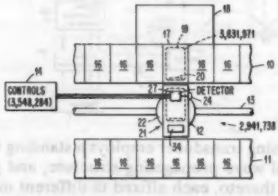


There has been provided a control for energizing an output device such as a fan motor in response to manual or condition sensitive means including: a first switching means responsive for enabling the motor when manually actuated. The first switching means has a relay with a stick circuit for coupling the actuating energy to the motor. The second switch means is responsively coupled to an output of the condition sensitive means and indicates the occurrence of a selected condition and is adapted when energized thereby for activating the first switch means. The second switch means includes a relay having a stick circuit for maintaining the activated condition regardless of the condition of said sensing means, while the stick circuit of the first switch means maintains activation thereof in response to only a momentary manual actuation. A master controller couples the source of activating energy to the motor when said first switch means has been actuated and a housing is adapted for receiving the control system and includes a door arrangement having a lever mounted thereon adapted for interlocking with the master controller for disabling the motor when actuated by said condition sensing means.

3,749,993
SECURITY SYSTEM FOR ARTICLE HANDLING APPARATUS

William H. Laman, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1972, Ser. No. 261,172
Int. Cl. G05b 9/02
U.S. Cl. 318—563 10 Claims

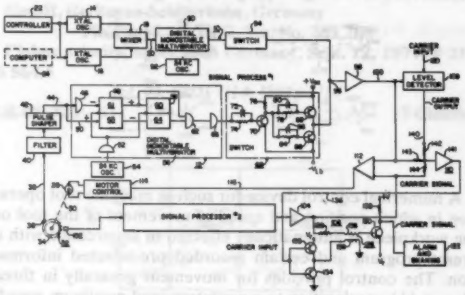


In an automatic article handling system, the article carrying conveyor or carriage includes sensing means for sensing characteristics of an article to be conveyed. If a given characteristic exceeds a predetermined threshold, the conveyor is automatically disabled requiring manual intervention to restart it which protects stored articles from said given characteristic. In a magnetic record document system, the given characteristic may be a magnetic field exceeding a predetermined threshold external to the article to be conveyed. Such external magnetic field could be capable of altering magnetic documents stored in the article handling system. In another version, the given characteristic could be weight or other undesired phenomena exceeding a given threshold.

3,749,994
SPEED CONTROL SYSTEM

Thomas C. Matty, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1971, Ser. No. 199,218
Int. Cl. G05b 9/02
U.S. Cl. 318—563 5 Claims

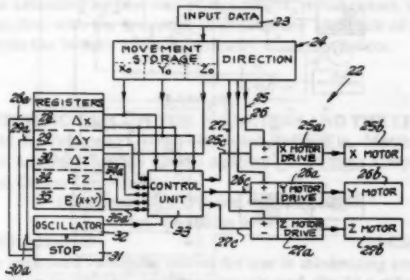


Speed control system, particularly adapted for use with automatic rapid transit systems, which employs hybrid analog-digital techniques and two independent redundant signal processing channels to achieve a high degree of fail safety as well as a high degree of speed control accuracy.

3,749,995
METHOD AND APPARATUS FOR PRODUCING DIGITAL CONTOUR MOVEMENT ON AT LEAST THREE AXES

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed July 5, 1972, Ser. No. 269,271
Int. Cl. G05b 19/24
U.S. Cl. 318—570 10 Claims

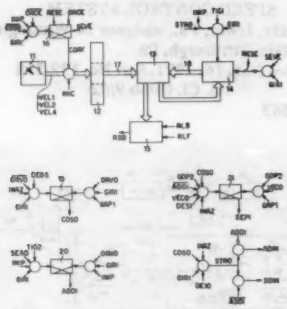


A method and apparatus for producing movement substantially along a path defined by information of the length of movement on each of three or four axes with the movement consisting of a plurality of sequentially taken, equal length increments or steps with each step being taken along one of the three or four axes and with there being a determination made after each step of the axis on which the next step is to be taken.

3,749,996
NUMERICAL CONTROL DEVICE FOR MACHINE TOOLS WITH PROVISION FOR SPEED ADJUSTMENT DURING MOTION

Piero Pomella, and Luciano Lauro, both of 10015 Ivrea, Italy, assignors to Ing. C. Olivett & C., S.P.A., Turin, Italy

Continuation of Ser. No. 759,912, Sept. 16, 1968, abandoned.
This application Jan. 28, 1971, Ser. No. 110,651
Claims priority, application Italy, Sept. 16, 1967, 53043/A67
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 4 Claims

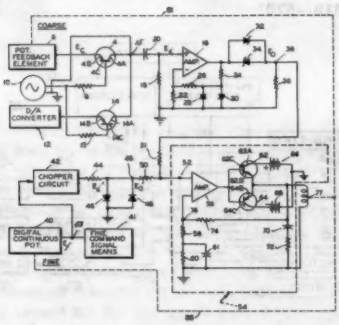


A numerical control device for such as machine tool operation in which position and speed of movement of the tool or the workpiece is automatically effected in accordance with a preset program and certain recorded pre-selected information. The control provides for movement generally in three phases: (1) acceleration to a predetermined maximum speed; (2) constant speed; and, (3) deceleration to zero speed. Also, adjustability of the maximum speed during movement is provided for.

3,749,997
MULTI-SPEED POTENTIOMETER SERVO

Richard L. Cohen, Old Bridge, and Robert G. Taylor, Wayne, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 31, 1971, Ser. No. 129,830
Int. Cl. G05b *11/18*
U.S. Cl. 318—592 5 Claims

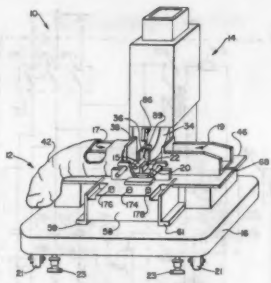


Amu multi-speed digital servo system uses coarse and fine error signals. The coarse error signal is modified and the fine error signal which is provided by combining a command signal with a feedback signal from a digital, continuous potentiometer is limited. The modified and limited signals are mixed to provide desired servo operation.

3,749,998
ROLLED COIN PACKER

Michael Nicholson, Tecumseh, Ontario, Canada, assignor to Sattley Company, Detroit, Mich.

Filed Aug. 25, 1971, Ser. No. 174,680
Int. Cl. B65b *57/20*
U.S. Cl. 53—59 R 10 Claims

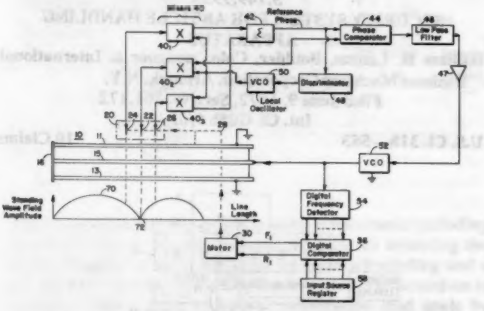


In a coin packer, a plate having a plunger mounted thereto is interposed between first and second horizontally aligned guideways. The plate is mounted for limited reciprocating movement in a direction along the longitudinal axes of the guideways. The plate is connected to a cam assembly which is further connected to a drive motor by means of a solenoid actuated clutch. A chute having a discharge opening in registration with the plate operates to position a wrapped roll of like coins on the plate for engagement by the plunger. A switch, energized by a roll of wrapped coins emitted from the chute, is operatively connected to the solenoid. When the switch is energized, the solenoid is actuated, whereby the plunger propels the roll through the first guideway. After a predetermined of rolls is propelled along the first guideway, a register-switch combination operates to position the plunger in such a way that a predetermined number of rolls is propelled through the second guideway.

3,749,999
POSITION SENSING TRANSDUCER INCLUDING AN ELECTRICAL WAVE PROPAGATING STRUCTURE OF VARYING ELECTRICAL LENGTH

Jans Kliphuis, Huntington, N.Y., assignor to Comtech Laboratories Inc., Smithtown, N.Y.

Filed June 23, 1972, Ser. No. 265,633
Int. Cl. G05b *1/06*
U.S. Cl. 318—369 10 Claims



A position sensing transducer employs a standing wave supporting electrical wave propagating structure, and probe apparatus coupled thereto, each affixed to different mechanical members adapted for relative translation therebetween. The wave propagating line is terminated other than by its iterative impedance, and feedback circuitry including a voltage con-

trolled oscillator is employed to vary the electrical length of the wave line such that a node in the resulting standing wave pattern is developed at the probe position. The oscillator output frequency thus provides a direct measure of physical probe positiong vis-a-vis the wave line termination, and thereby also of the relative displacement of the two mechanical members.

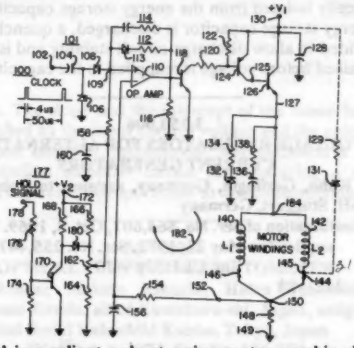
In accordance with a further aspect of the present invention, the transducer may be included in a servomechanism arrangement to automatically position the mechanical members in a prescribed physical relationship along the controlled axis.

3,750,000

STEPPING MOTOR EXCITER APPARATUS AND METHOD

Ronald L. Bruckner, and James E. Helmbold, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 19, 1972, Ser. No. 264,173
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **19 Claims**



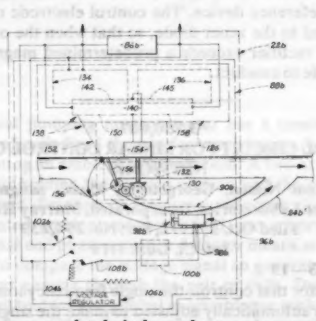
Disclosed is a salient pole stepping motor combined with high frequency current regulating chopper mode excitation apparatus connected to differentially excite at least two sets of electrical windings of the stepping motor in an excitation method wherein winding current is responsive to instantaneous rotor produced changes in electrical winding inductance.

3,750,001

REMOTE, COMPLETELY SELF-CONTAINED, SELF-MAINTAINING POWER SUPPLY APPARATUS FOR POWERING A PRESSURIZED-LIQUID DISTRIBUTING AND DISSEMINATING SYSTEM

Edward W. McCloskey, 271 Alpine St., Pasadena, Calif.

Continuation-in-part of Ser. No. 880,851, Nov. 28, 1969, Pat. No. 3,642,204. This application Oct. 15, 1970, Ser. No. 80,999
Int. Cl. F03b *13/10*; H02k *7/18*; H02j *7/32*
U.S. Cl. 320—61 **7 Claims**



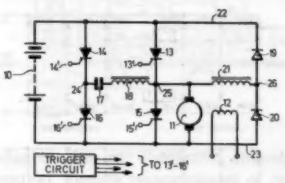
One or more completely independent power supply means, each intended for powering one or more power utilization devices associated with a pressurized-liquid-transmission system, and the combination thereof with an automatically controlled, pressurized distributing and disseminating system which, in a preferred form, includes a pressurized-liquid-transmission main pipe means and, for each self-contained powering unit, at least one servo motor means and a power utilization device operated thereby and associated with the pressurized-liquid-transmission main pipe means in a particular desired pressurized-liquid-flow-modifying manner. In a preferred form, the power supply apparatus includes electrical energy storage means and pressurized-liquid-flow-powered electrical generating means for recharging the electrical energy storage means, in one preferred form in a manner which is effectively a function of the deficiency of the magnitude or quantity of electrical energy stored in the electrical energy storage means.

3,750,002

BATTERY CONNECTED DYNAMO ELECTRIC MACHINE SYSTEM

Albert Gerhard, Stuttgart, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Sept. 15, 1972, Ser. No. 289,280
Claims priority, application Germany, Sept. 17, 1971, P 21 46 564.5
Int. Cl. H02j *7/14*; H02p *3/14*
U.S. Cl. 320—61 **7 Claims**



To provide for low-loss operation of a dynamo electric machine in motor mode from a battery, and to provide for feedback of energy into the battery in generator mode, a bridge-circuit includes four thyristors connected across a diagonal to the battery, one branch being the supply branch and including a motor mode supply thyristor and a generator mode supply thyristor, in series, and the other branch including a pair of extinction thristors; an inductance and capacitor are connected, in series, across the other diagonal of the bridge to provide a commutating circuit, the armature of the dynamo electric machine being connected in parallel with one of the thyristors in the operating branch. A pair of diodes or suitably triggered thyristors are preferably additionally connected across the battery and having their junction connected to the armature so that one of the diodes, or thyristors, is in connection with the armature to provide for feedback of current into the battery when in generator mode operation.

3,750,003

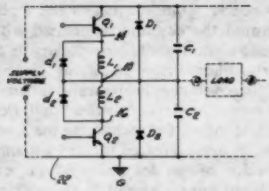
SWITCHING CIRCUIT FOR INVERTERS AND THE LIKE

Harold E. Petersen, Culver City, and Richard A. Matthews, Los Angeles, both of Calif., assignors to Pedima Corporation, Culver City, Calif.

Filed June 15, 1972, Ser. No. 263,122
Int. Cl. H02m *1/18*
U.S. Cl. 321—12 **11 Claims**

An improved switching circuit for use in minimizing energy dissipation in DC/AC inverter circuits and the like wherein on/off circuit elements such as transistors are connected in series with a power supply for driving a load connected at a junction point between the transistors, with auxiliary drive means connected to the on/off circuit elements for simultaneously actuating them to become conductive and non-conductive, respectively. Each of two non-coupled inductors are positioned in series with an on/off circuit element on both sides of the junction point, and capacitance means is provided

between the junction point and the power supply. A diode is connected in parallel with each inductor and also with the



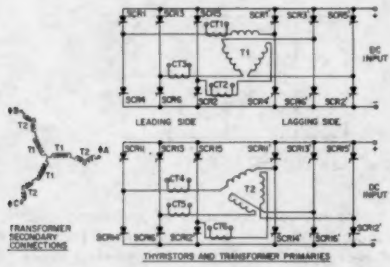
on/off circuit element and inductor on each side of the junction point.

3,750,004

INSTANTANEOUS CURRENT CONTROL FOR STATIC INVERTERS

Loren H. Walker, Raleigh, N.C., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Feb. 23, 1972, Ser. No. 228,632
Int. Cl. H02m 1/18
U.S. Cl. 321—14 **9 Claims**



An improvement is made to stepped wave static inverters in the form of an instantaneous current control circuit. In case of overload of faults on the inverter output, this circuit acts to limit current in the power switching devices of the inverter. Its performance is an improvement over previous current limit circuits in that it acts instantly to limit overload current and instantly to release that limit so that normal output voltage is restored immediately when the overload is removed. A furtheperformance improvement results because this circuit acts to limit current in the individual power switching devices without necessarily reducing the output voltage of all phases of the inverter.

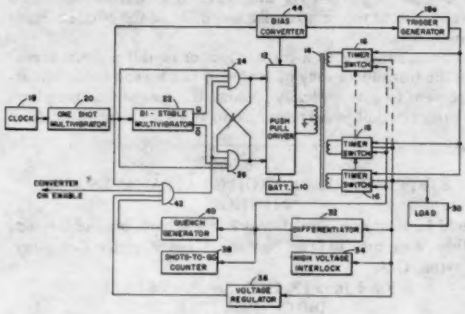
3,750,005

HIGH EFFICIENCY CONSTANT VOLTAGE TO CONSTANT CURRENT CONVERTER FOR ENERGY STORAGE

George R. Downes, Jr., Orlando; Stanley F. Brewer, Winter Park, and James E. Murtha, Orlando, all of Fla., assignors to the United States of America as represented by the Secretary of the Army

Filed Sept. 20, 1971, Ser. No. 181,897
Int. Cl. H02m 7/00
U.S. Cl. 321—18 **15 Claims**

A constant voltage to constant current converter for providing a highly efficient charge to energy storage networks is provided. Energy from a power transformer is delivered to a storage capacitor through a tap switching arrangement providing substantial improvement in efficiency. The approximation of a constant current supply is obtained by sequentially seriesing the rectified secondaries of the power transformer as a function of time relative to the state of charge on the capacitor. The direct current voltage across the energy storage device is rapidly increased in gated steps until a desired level of charge is obtained, at which time the charging source is automatically isolated from the energy storage capacitor. When the energy storage capacitor is discharged, a quench function is provided to allow discharge circuit stability and isolation to be obtained before voltage is reapplied to the capacitor bank.

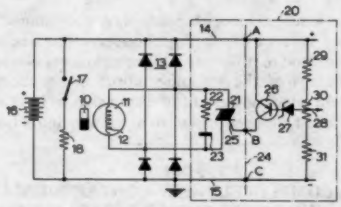


3,750,006

VOLTAGE REGULATORS FOR ALTERNATING CURRENT GENERATORS

Edgar Kuhn, Gerlingin, Germany, assignor to Robert Bosch GmbH, Stuggart, Germany

Continuation of Ser. No. 864,601, Oct. 8, 1969. This application May 22, 1972, Ser. No. 255,447
Int. Cl. H02p 9/30
U.S. Cl. 322—28 **13 Claims**



A voltage regulating arrangement in which an alternating current generator excited through permanent magnetic means, has its output winding connected to a triac. The output winding of the generator is also connected to a rectifying bridge which converts the A.C. output of the generator into corresponding D.C. current. The rectifier output is applied to a voltage divider which, in turn, feeds a zener diode serving as a voltage reference device. The control electrode of the triac is connected to the zener diode, so that when the output voltage of the rectifier exceeds a predetermined magnitude, the triac is made to conduct.

3,750,007

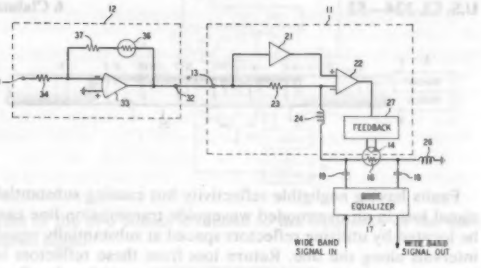
CONTROL CIRCUIT FOR LINEAR CONTROL OF BODE NETWORK

Richard Kent Nelson, Georgetown, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 2, 1972, Ser. No. 294,239
Int. Cl. G05f 1/10
U.S. Cl. 323—19 **8 Claims**

The resistor that controls the single frequency loss of a Bode equalizer is automatically adjusted to make the single frequency loss variation a linear function of the inverse of an input control voltage. The input control signal is applied to a first input of a differential amplifier through a variable gain ampli-

fier and to a voltage divider comprising the Bode control resistor and a resistance equal to the reference resistance of the Bode equalizer. The voltage across the Bode control resistor is applied to the other input of the differential amplifier, and the output of the differential amplifier is held constant by a feedback loop. The slope and the intercept of the linear function are controlled by the input control voltage and the gain of the variable gain amplifier, respectively. Also disclosed is a feedback controlled amplifier circuit for producing a control signal that is inversely proportional to sensed temperature.

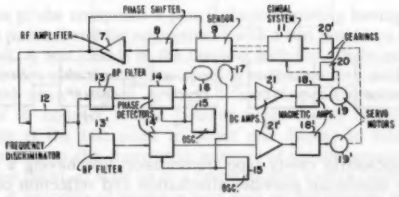


3,750,008

OPTICAL PUMPING MAGNETOMETER

Hiroshi Asano; Makoto Kikuchi; Hideo Takeuchi, and Michimasa Kondo, all of Kamakura-shi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1971, Ser. No. 186,050
Claims priority, application Japan, Oct. 2, 1970, 45/86428
Int. Cl. G01r *33/08*
U.S. Cl. 324—0.5 R **8 Claims**



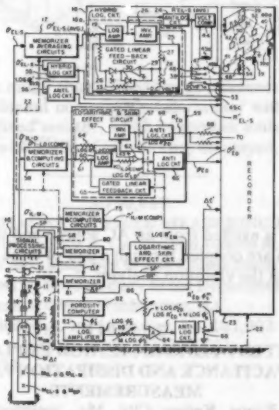
An optical pumping magnetometer has a sensing portion and a pair of coils fixed thereto for receiving an A.C. current for modulating an ambient magnetic field. A two axis gimbal is provided for holding the sensing portion and the pair of coils at any desired direction. A frequency discriminator connects the modulated ambient magnetic field into a corresponding voltage signal and phase sensitive detector means are provided and serve to compare the voltage signal so generated with the A.C. current passing through the pair of coils. Driver means are provided to drive the gimbal in accordance with the output of the phase sensitive detector means such that the sensing portion is automatically controlled so as to maintain a specific angle to the direction of the ambient magnetic field.

3,750,009

APPARATUS FOR PROCESSING WELL LOGGING SIGNALS INCLUDING CONTROL MEANS FOR CONTROLLING THE SIGNAL RESOLUTION AND THE SPEED OF RESPONSE OF THE SIGNAL INDICATING MEANS

John H. Baker, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 765,563, Oct. 7, 1968, Pat. No. 3,609,518.
This application Dec. 28, 1970, Ser. No. 105,681
Int. Cl. G01v *3/18*; G01r *15/08*
U.S. Cl. 324—1 **3 Claims**



In accordance with an illustrative embodiment of the present invention, logging measurements of radially shallow conductivity from an electrode logging tool, radially deep and medium conductivity from an induction logging tool, acoustic travel time from a sonic logging tool, as well as natural gamma-ray and spontaneous potential measurements are processed for recording as a function of borehole depth. More specifically, the shallow conductivity measurement signals are averaged and applied to a hybrid logarithmic circuit which operates to form a logarithm function thereof until the signal amplitude reaches a predetermined level at which time a linear function of the measurement signals is formed. The output signals from the hybrid logarithmic circuit are recorded with three separate degrees of resolution using only two galvanometers by multiplexing two signals on one galvanometer. A speed-up circuit is utilized to prevent the galvanometer retrace from appearing on the recording medium. The induction logging signals are processed by suitable computing circuits to sharpen their resolution and then applied to hybrid logarithmic and skin effect circuits which, in addition to forming the logarithmic and linear functions, provides a skin effect correction. The resulting processed induction logging measurements are recorded with differing degrees of resolution and the radially deep measurement signals are combined with acoustic travel time derived porosity measurements to produce indications of the resistivity of the formation fluids.

3,750,010

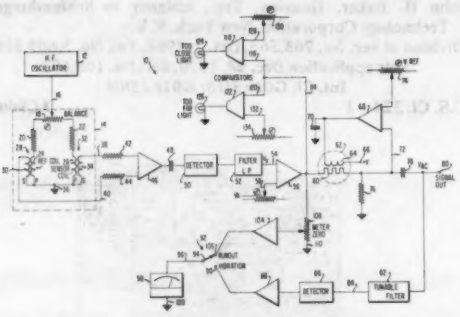
VIBRATION ANALYZER PROBE WITH REDUCED TEMPERATURE SENSITIVITY

Albert C. Abnett, Westerville, and Robert A. Boley, Columbus, both of Ohio, assignors to Reliance Electric Company, Columbus, Ohio

Filed Mar. 25, 1970, Ser. No. 22,602
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 D **10 Claims**

Disclosed is a simplified and inexpensive probe for non-contacting vibration analyzers, and an analyzer employing the probe, which probe is substantially insensitive to temperature

variations. The probe comprises a bridge including sensor and reference coils in two bridge legs forming the primaries of two transformers. A pair of resistors form the other bridge legs.



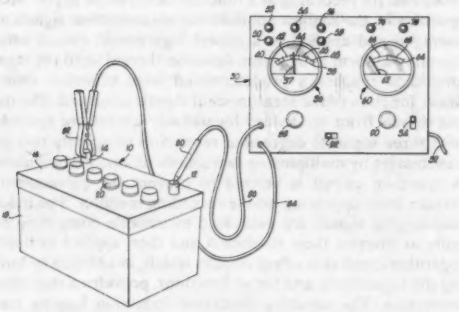
The bridge is excited from an AC source and the transformer secondaries are coupled through a pair of large resistors to the remainder of the vibration analyzer.

3,750,011

BATTERY TESTING METHOD EMPLOYING CAPACITANCE AND DISSIPATION FACTOR MEASUREMENTS

Robert W. Kreps, Kansas City, Mo., assignor to Farmland Industries Inc., Kansas City, Mo.

Filed Mar. 20, 1972, Ser. No. 236,400
Int. Cl. G01m 27/42
U.S. Cl. 324—29.5 **4 Claims**



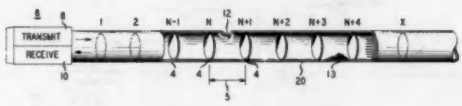
A method for testing electrical storage batteries employs a measurement of electrical capacitance between the battery terminal posts to indicate whether the constructional quality of the battery is acceptable and, if not, to further indicate the class of defect involved, and employs a measurement of the dissipation factor of electrical capacitance between the battery terminal posts to indicate whether the degree of oxidation of the electrode plates is within acceptable limits, which measurements and indications are preferably employed in conjunction with each other when full testing of a battery is desired but may also be used separately when only testing for a particular kind of defect is desired. The method is further characterized, in that, the measurements of capacitance and dissipation factor are made while the battery is in "dry" condition without any electrolyte present therein.

3,750,012

FAULT LOCATING SYSTEM FOR WAVEGUIDE TRANSMISSION LINE UTILIZING SPACED REFLECTORS

Rufus Gustavus Fellers, Columbia, S.C., and Larry Wardell, Hinderks, Plainfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkley Heights, N.J.

Filed , Ser. No. 215,566
Int. Cl. G01r 31/11
U.S. Cl. 324—52 **6 Claims**



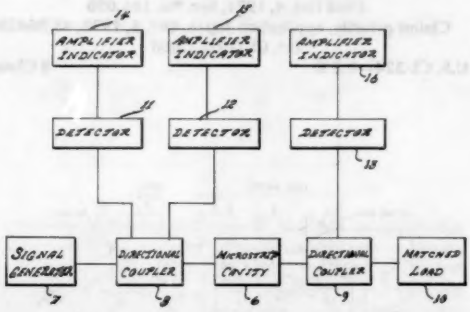
Faults having negligible reflectivity but causing substantial signal loss in an overmoded waveguide transmission line can be located by utilizing reflectors spaced at substantially equal intervals along the line. Return loss from these reflectors is measured and faults localized between any two of such reflectors by detecting any departure of the return loss from a linear increase with distance.

3,750,013

MICROSTRIP PLASMA PROBE

Walter Rotman, Brighton, and Nicholas V. Karas, Lowell, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 21, 1970, Ser. No. 82,657
Int. Cl. G01r 27/04
U.S. Cl. 324—58 **1 Claim**



A microstrip cavity type transmission line having a lossy center conductor provides attenuation and reflection coefficient information in response to the disturbing effects of proximate conducting surfaces or plasma. Equivalent conductance and susceptance of the plasma and the proximity of conducting surfaces can be determined by using such information to solve standard transmission line formulas.

3,750,014

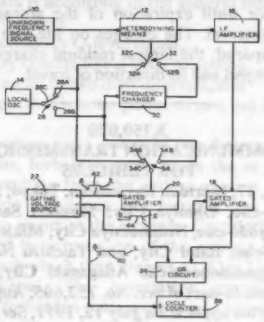
FREQUENCY MEASURING APPARATUS

Norman W. Gaw, Jr., Boonton, N.J., assignor to Gaw Co. Inc., Lincoln Park, N.J.

Filed July 23, 1971, Ser. No. 165,061
Int. Cl. G01r 23/14
U.S. Cl. 324—79 D **6 Claims**

The frequency of an unknown signal is measured by heterodyning the signal with a signal of known frequency. The number of cycles of the difference signal resulting from the heterodyning occurring during a given period of time is

counted as is the number of cycles of the signal with known frequency occurring during another given period of time. The



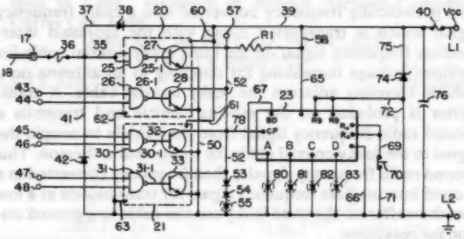
sum of the two counts is related to the frequency of the unknown signal.

3,750,015

DIGITAL LOGIC TEST PROBE FOR INDICATING BOTH SIGNAL LEVELS AS WELL AS A COUNT OF CHANGES IN SIGNAL LEVELS

Roger N. Sheker, and Raymond J. Ballou, both of Rochester, N.Y., assignors to Comtec Industries, Inc., Rochester, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,880
Int. Cl. G01r 31/02
U.S. Cl. 324—72.5 **10 Claims**



The probe comprises a pencil-shaped housing having a pin in its pointed end for engagement with a test point in a digital circuit. A test circuit in the housing includes a light emitting diode viewable through an opening in the housing, and energizable when a signal, or logic 1 level, is present at the test point. A counter in the housing responds to intermittent signals at the test point to count and display in binary or decimal form the cumulative number of signals appearing at the test point, at least up to a count of nine before resetting to zero. A plurality of auxiliary terminals on the housing may be connected optionally to other test points in the circuit to sense other signals, which are anded with the signal from the primary test point to prevent the latter from energizing the diode and actuating the counter except when signals are present at all said other test points.

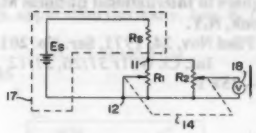
3,750,016

RF-SOURCE RESISTANCE METERS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to the invention of, and Ernest C. Oakley, Pasadena, Calif.

Filed Feb. 19, 1971, Ser. No. 116,790
Int. Cl. G01r 27/00, 27/42
U.S. Cl. 324—57 R **3 Claims**

Several embodiments of RF source resistance measuring devices are disclosed. Common to all embodiments is the feature of the inclusion of at least one variable resistor, and a peak readout meter. In one embodiment, two ganged unloaded potentiometers are employed while another embodiment comprises an automatic-nulling RF power bridge circuit



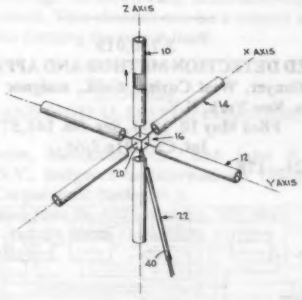
with a variable rather than a fixed bridge reference resistance. A third embodiment comprises a calorimeter with a variable rather than a fixed resistor, while in another embodiment attenuator pads with variable resistors are employed.

3,750,017

ELECTROMAGNETIC FIELD MEASURING DEVICE

Ronald R. Bowman; Ezra B. Larsen, and Donald R. Belsher, all of Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

Filed Sept. 16, 1971, Ser. No. 181,003
Int. Cl. G01r 31/02, 33/02
U.S. Cl. 324—72 **14 Claims**

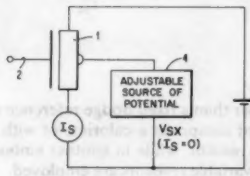


An electromagnetic field measuring device is disclosed having a response which is essentially independent of the physical orientation of the device in the electromagnetic field. Further, the response of the device is essentially independent of the polarization of the field or of the presence of reactive field components or multipath interference. A set of three antennas disposed in a mutually-orthogonal relationship with an essentially common center is provided, the antennas being adapted to be placed in an electromagnetic field to be measured. Sensing means, in the form of diodes for example, are associated with each antenna for deriving a signal therefrom. In the preferred embodiment, such antennas may take the form of dipoles, and diodes are contemplated to be connected between the dipole legs. The derived signals so produced are removed from the antennas in a fashion wherein no substantial perturbation of the field to be measured occurs and without substantially affecting the electrical characteristics of the antenna set. In a preferred embodiment, a high-resistance transmission line is provided. Subsequently, the derived and removed signals are combined and processed so as to generate a measurement reading.

3,750,018
UNGATED FET METHOD FOR MEASURING INTEGRATED CIRCUIT PASSIVATION FILM CHARGE DENSITY

Louis William Leone; Theodore Adam Morange; Donald Francis Reilly, and Paul James Schram, all of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,677
Int. Cl. G01r *31/26, 31/12*
U.S. Cl. 324—158 T **4 Claims**

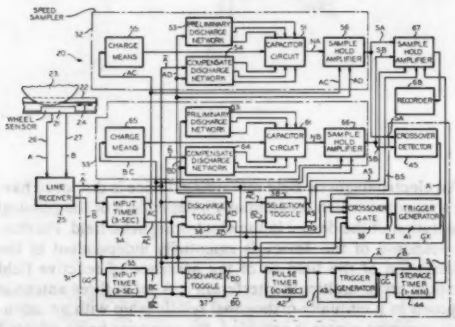


An ungated FET having an annular drain surrounding a central source is formed on a test site on the same semiconductor chip with product FET devices. All FETs are covered with a passivating film whose charge level is to be determined. An off-chip operational amplifier circuit is connected to the ungated FET to provide automatically whatever source-to-substrate bias is required to cause a negligibly small source-to-drain current, e.g., 0.5 microamps to flow. The potential difference between the source and substrate is measured while the aforesaid negligibly small source-to-drain current is flowing. The charge level in the passivating material covering the product FET devices as well as the ungated FET device is calculated using the measured source-to-substrate bias.

3,750,019
SPEED DETECTION METHOD AND APPARATUS

Carl G. Blanyer, West Covina, Calif., assignor to Abex Corporation, New York, N.Y.

Filed May 10, 1971, Ser. No. 141,571
Int. Cl. G01p *3/66*
U.S. Cl. 324—178 **24 Claims**



A method and apparatus, operable over a given speed range, for detecting the speed of an object moving past a sensor which develops two electrical signals, each enduring for a time interval that varies inversely with the speed of the object and in inverse relation to the distance between the object and the sensor, the signals being spaced by a time gap that varies inversely with the speed of the object and that also varies as a function of the distance between the object and the sensor. A first capacitor circuit, charged prior to initiation of the sensor signals, is discharged at a given rate during one signal and discharged at a second faster rate thereafter until the other signal starts or until expiration of an extended time interval longer than the longest time gap for the speed range. A similar capacitor circuit is discharged at the given rate during the other signal and at the second rate thereafter until the one signal starts or until expiration of the aforementioned extended time interval. The charges on the two capacitor circuits are compared; the largest residual charge indicates the speed of the object and its direction of travel.

3,750,020
RADIO COMMUNICATION TRANSMISSION SYSTEM FOR VEHICLES

Takeshi Baba, 27, Inaridai, Itavashi-ku, Tokyo; Kenji Shibuya, 1-1, Taisei-cho, Ohmiya City; Masaaki Sasada, 406, 45 Goto, 30 Ryodo-cho, Nishinomiya City; Mikio Nakagawa, 1-23, Umeki-cho, Itami City, and Taichiro Nagao, 76-5, 3-chome, Higashisonoda-cho Anagasaki City, all of Japan

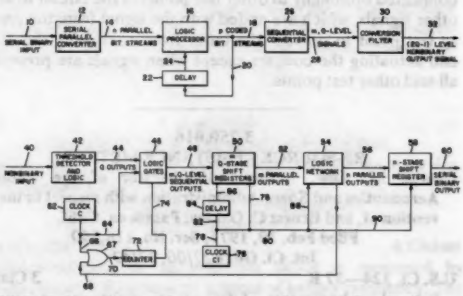
Continuation-in-part of Ser. No. 752,605, Aug. 14, 1968, abandoned. This application July 12, 1971, Ser. No. 161,439
Claims priority, application Japan, Aug. 17, 1967, 42/53051
Int. Cl. H04b *7/20*
U.S. Cl. 325—5 **3 Claims**

A radio communication transmission system for moving vehicles following a track wherein an intermediate frequency communication signal is transmitted on a leaky coaxial cable at a low loss from a ground station. This signal is periodically amplified, if required, to compensate for attenuation, and is also periodically frequency converted into a radio frequency signal which is transmitted along with the aforesaid intermediate frequency signal on the same leaky coaxial cable for uniform leakage therealong for coupling to an antenna on a vehicle traveling adjacent the leaky coaxial cable. A transmitter is proivded on the moving vehicle and transmits a second radio frequency signal from the vehicle to couple the signal to the leaky coaxial cable for transmission thereon. This second radio frequency signal is then frequency converted to a second intermediate frequency signal for transmission at a low loss thereafter on the same leaky coaxial cable to a ground station for reception.

3,750,021
DATA TRANSMISSION EMPLOYING CORRELATIVE NONBINARY CODING WHERE THE NUMBER OF BITS PER DIGIT IS NOT AN INTEGER

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 14, 1971, Ser. No. 152,875
Int. Cl. H04b *1/00*
U.S. Cl. 325—38 A **10 Claims**



A digital transmission system in which serial binary data is changed, by encoding and correlative conversion, into a non-

binary signal of $(2Q-1)$-levels for transmission of the binary data at a rate in bits per second that exceeds twice the frequency bandwidth of the channel in hertz. Encoding of the serial binary data is according to the general relation of $C = B + \Delta^2 C$ modulo Q where

C = coded nonbinary Q-level signal,
B = nonbinary Q-level signal prior to coding,
$\Delta 2$ = a delay equal to two digit intervals, and
Q = an integer that is not a power of two but is greater than one.

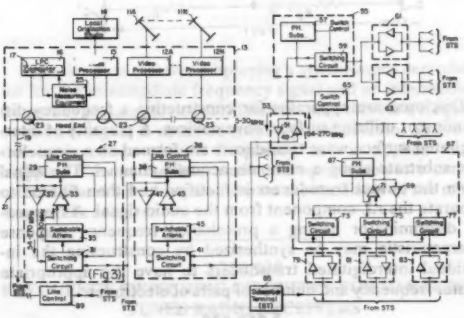
The use of Q values not a power of two dictates the need for redundant digits, forbidden patterns, in the m sequential Q-level signals resulting from the coding process. This reduces the transmission efficiency but permits the detection of synchronization errors at the receiver. Correlative conversion is accomplished by subtraction of the present digit from the second digit back which then creates a $(2Q-1)$-level correlative coded signal. The correlative conversion process eliminates any forbidden patterns that may have appeared as a result of the coding process. Thus, any forbidden patterns present during decoding result from fortuitous disturbances which may occur following correlative conversion. These forbidden patterns may represent lack of synchronization and the framing pattern of the receiver is adjusted using this detected information. The original binary data is recovered by first slicing and then demultiplexing to obtain m, Q-level signals. Finally, logic processing and parallel-to-serial conversion are used to obtain the serial binary data.

3,750,022

SYSTEM FOR MINIMIZING UPSTREAM NOISE IN A SUBSCRIBER RESPONSE CABLE TELEVISION SYSTEM

Samuel J. Curry, Los Angeles, and Sam Reisenfeld, Reseda, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 26, 1972, Ser. No. 247,622
Int. Cl. H04b 1/00
U.S. Cl. 325—53 **17 Claims**



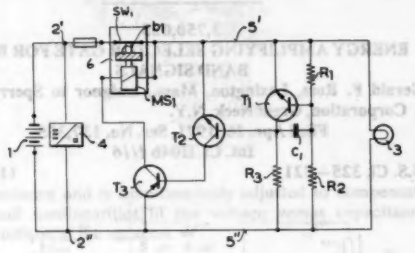
A system for substantially reducing the effects of noise and interference in the upstream transmission path of a two-way CATV system. In one embodiment, a local processing center located at the headend of the cable television system locates a noise source and then commands selected phantom subscriber units in the system to close predetermined radio frequency switches to only allow a desired upstream transmission to be passed to the headend and to switch out all other upstream transmission paths not being used.

3,750,023

VISUAL AND RF BEACON FOR MINER'S HAT WITH CONTROL CIRCUIT

Dieter Weissenborn, Mulheim/Ruhr; Ortwin Bock, Duisburg, and Norbert Werding, Essen-Heisingen, all of Germany, assignors to Friemann & Wolf GmbH, Duisburg, Germany

Filed Aug. 5, 1971, Ser. No. 169,414
Claims priority, application Germany, Aug. 8, 1970, P 20 39 471.2
Int. Cl. H04b 1/04
U.S. Cl. 325—105 **8 Claims**



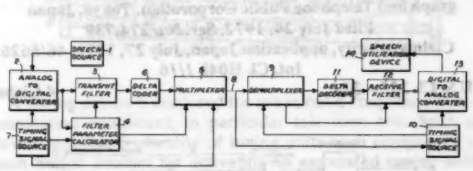
A lamp and a radio transmitter are connected in parallel across a battery in a miner's hat to provide a visual and radio-frequency beacon enabling finding him in an emergency situation. In order to prevent the lamp from depleting the battery which would cut off the radio beacon, an involuntarily opened nonresettable switch is provided that disconnects the battery from everything but the transmitter. A voltage detector connected across the lamp senses when the voltage applied to this lamp drops below a predetermined level and closes a circuit to pass current through an electrically actuatable element for opening the switch. This element can be a minute squib or a fuse-type device forming the switch itself.

3,750,024

NARROW BAND DIGITAL SPEECH COMMUNICATION SYSTEM

James G. Dunn, Montclair, N.J., and John R. Cowan, Brooklyn, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 16, 1971, Ser. No. 153,591
Int. Cl. H04b 1/66; H03k 13/22
U.S. Cl. 325—38 B **19 Claims**



Speech to be transmitted is sampled at a given rate with each of the samples being converted to a binary representation of its amplitude. A digital arithmetic unit under control of predetermined program determines from the binary representations of the two immediately preceeding samples the redundant information of the speech, a weighting parameter of the redundant information and removes this redundant information from the speech to produce a residual non-redundant signal. The weighting parameter is transmitted according to a predetermined binary code having a given number of binary bits and the residual signal is transmitted by delta modulation. The binary code representation of the weighting parameter and the delta modulation representing the residual signal are time multiplexed for transmission to a receiver. At least one distinctive combination of bits of a code group of the weighting parameter is employed to indicate an out-of-

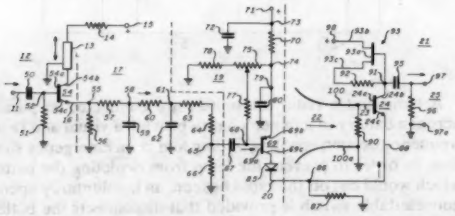
synchronization condition. The clock recovery, framing and timing signal at the receiver are derived from the code groups representing the weighting parameter. A digital arithmetic units in the receiver responds to the weighting parameter code groups and the delta modulation to reconstruct the binary representations of the speech samples. The binary representations of the speech samples are converted to a analog signal and passed through a low pass filter to reconstruct the speech for utilization. The size of the delta modulation step is adjusted in the receiver in accordance with the number of delta modulation bits having a given polarity in sequence.

3,750,025

ENERGY AMPLIFYING SELECTOR GATE FOR BASE-BAND SIGNALS

Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Apr. 26, 1971, Ser. No. 137,355
Int. Cl. H04b 1/16
U.S. Cl. 325—321 **11 Claims**



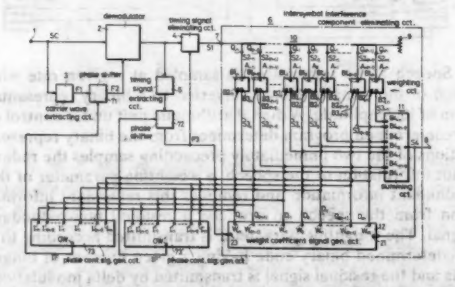
Energy amplifying timed selector or gating circuits for sampling base-band signals, such as directively transmitted signals reflected from objects, include a dispersionless, broad band transmission line system cooperating with a biased semi-conductor receiver-detector located in the transmission line system for instantaneously gating and detecting substantially the total energy of base-band signals and for providing corresponding time selected or gated outputs suitable for indication of the presence of such gated pulses.

3,750,026

INTERSYMBOL INTERFERENCE COMPONENT ELIMINATING SYSTEM

Kazuhisa Watanabe, Tokyo, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed July 24, 1972, Ser. No. 274,739
Claims priority, application Japan, July 27, 1971, 46/56263
Int. Cl. H04b 1/16
U.S. Cl. 325—321 **4 Claims**



An intersymbol interference component eliminating system having a demodulator supplied with a carrier wave to demodulate an amplitude modulated digital symbol synchronized with a timing signal, and an intersymbol interference component eliminating circuit including a delay line supplied with a demodulated digital symbol derived from the demodulator, a weighting circuit $A_j (j = n, -(n-1), \ldots -1, 0, +1, \ldots +(n-1)$ and $+n)$ supplied with an output derived from a terminal Q_j of the delay line, a circuit for summing outputs of the weighting circuits and a circuit for generating a weight coefficient control signal D_j based on the output of the summing circuit and the timing signal, the circuit A_j being controlled in its weight coefficient C_j by the signal D_j, in which circuits are provided for generating carrier wave and timing signal phase control signals respectively based on the signals D_{-n}, $D_{-(n-1)}, \ldots D_{-1}$, $D_{+1}, \ldots D_{+(n-1)}$ and D_{+n}, the carrier wave and timing signal phase control signals corresponding to

$$\Delta I_C = \sum_{\substack{k=-n \\ \neq 0}}^{+n} \frac{C_k}{\alpha_{kC}} \text{ and } \Delta I_T = \sum_{\substack{k=-n \\ \neq 0}}^{+n} \frac{C_k}{\alpha'_{kC}}$$

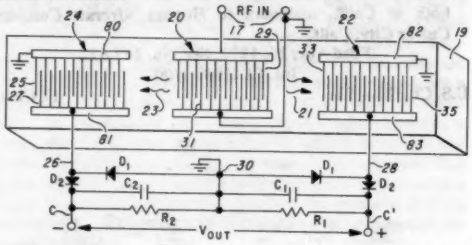
respectively $(k = -n, -(n-1), \ldots -1, +1, \ldots +(n-1)$ and $+n)$ and α_{kC} and α'_{kC} being predetermined weight coefficients corresponding to the coefficient C_k in the case where only the phases of the carrier wave and the timing signal shift by predetermined amounts respectively, and circuits are provided for shifting the phases of the carrier wave and the timing signal based on the carrier wave and timing signal phase control signals respectively.

3,750,027

SURFACE WAVE FREQUENCY DISCRIMINATORS

Clinton S. Hartmann, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 12, 1970, Ser. No. 63,190
Int. Cl. H03d 3/06
U.S. Cl. 325—349 **18 Claims**



Disclosed are apparatus for constructing a frequency discriminator utilizing surface wave devices. A plurality of interdigitated surface wave transducers are formed on a piezoelectric substrate along a common acoustic channel. The signal from the output transducers is rectified and then filtered to separate the r.f. component from the audio signal. A frequency discriminator having a preselected frequency response characteristic may be synthesized by constructing the individual interdigitated transducers to have the appropriate center frequency and number of pairs of electrodes.

3,750,028

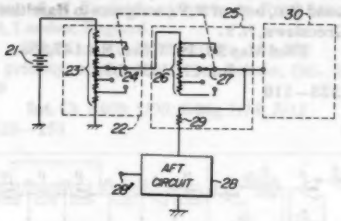
TUNING SYSTEM

Kosaku Uchida, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 21, 1971, Ser. No. 154,980
Claims priority, application Japan, June 25, 1970, 45/55682; June 25, 1970, 45/55683
Int. Cl. H03h 5/12; H03j 3/06
U.S. Cl. 325—418 **4 Claims**

A tuning system comprising a tuning circuit for selecting a channel, by the impedance of a variable capacitance diode, a power supply for generating a tuning voltage, and an AFT circuit for generating an AFT (automatic fine tuning) voltage. The power supply and the AFT circuit are connected in parallel with each other so that the tuning voltage and the AFT voltage are superimposed one on the other and applied to one

of the terminals of the variable capacitance diode, while the other terminal of the variable capacitance diode may be



grounded in order to check the increase in floating capacitance and tune in, to a wide range of frequencies.

3,750,029

TELEVISION RECEIVER

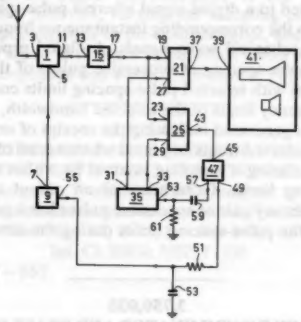
Nicolaas Joris Baars, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,818

Claims priority, application Netherlands, Nov. 21, 1970, 7017068

Int. Cl. H04b *1/16*

U.S. Cl. 325—420 **9 Claims**



In a television receiver employing a synchronous demodulator for the intermediate frequency signal and an intermediate frequency picture carrier oscillator coupled thereto a frequency control signal is obtained from a phase detector active on the intermediate picture frequency and is applied via a highpass filter to the intermediate frequency picture carrier oscillator and via a lowpass filter to the oscillator of the mixer stage of the receiver.

3,750,030

FREQUENCY SWITCHING CIRCUITRY FOR VARACTOR TUNED RADIO RECEIVERS

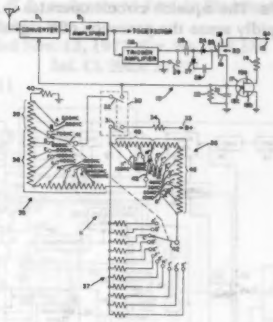
Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,304

Int. Cl. H04b *1/26*

U.S. Cl. 325—422 **6 Claims**

In a varactor tuned radio receiver which utilizes scan circuitry to tune the receiver, frequency switching circuitry is provided for developing a voltage across a scan control capacitor for application to the scan circuitry to tune the receiver to within a particular range of the desired frequency within one of a plurality of spreadbands. The frequency switching circuitry includes first, second, and third variable resistances connected in circuit with the scan control capacitor. Adjustment of the first variable resistance tunes the receiver to within a first relatively broad range within a desired spreadband. Adjustment of the second variable resistance tunes the receiver to within a second narrower range within the first range. The third variable resistance is ganged to the first variable resistance and is simultaneously adjusted to compensate for small nonlinearities in the voltage versus capacitance characteristic of the varactor.



3,750,031

TUNING DEVICE FOR RADIO-FREQUENCY COMMUNICATIONS EQUIPMENT

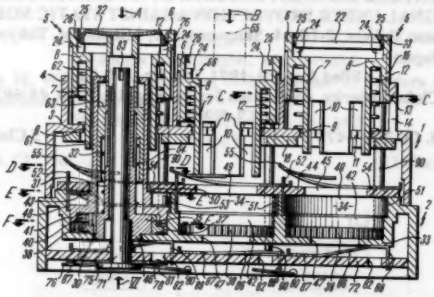
Rudolf Mayer, Rottweil; Hans Sakautzki, Stetten ob Rottweil, and Lothar Volkheimer, Trossingen, all of Germany, assignors to Hopt Electronic GmbH, Germany

Filed July 6, 1971, Ser. No. 159,780

Claims priority, application Germany, July 10, 1970, P 20 34 250.1

Int. Cl. H04b *1/16*

U.S. Cl. 325—452 **23 Claims**



A tuning device is disclosed for use in radio-frequency communication equipment, in particular television sets. Such a device includes a plurality of tuning units each comprising a push button contact for activating an associated tuning unit and a potentiometer, operatively connected to said push button, to permit selective tuning. Fine tuning is achieved in each tuning unit by an eccentric attached to a tuning spindle to operatively connect the potentiometer.

3,750,032

PRIORITY CHANNEL SCANNING SYSTEM WITH DUAL RESPONSE TIME CONTROL

James E. Andrews, Schaumburg, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

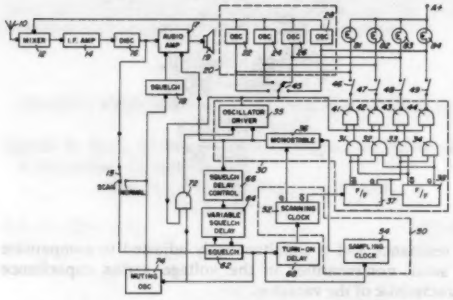
Filed Feb. 24, 1972, Ser. No. 228,980

Int. Cl. H04b *1/36*

U.S. Cl. 325—470 **24 Claims**

A channel scanning and priority channel monitoring system for a multi-channel receiver includes a high frequency clock and a sequencing switch to rapidly scan the channels for

signals and a low frequency clock and sampling switch to periodically monitor the priority channel for short time intervals during the reception of a non-priority signal. A variable response time squelch circuit is used to control the operation of the clocks. The squelch circuit operates in a fast response mode to rapidly sense the presence of a signal. After a signal



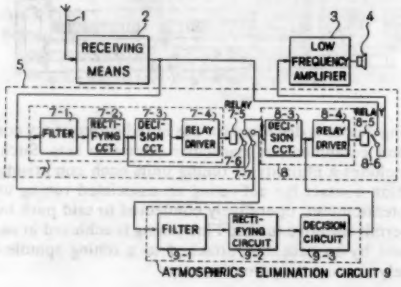
has been acquired, the response time of the squelch circuit is determined by the strength of the signal being received, the squelch circuit operating in conjunction with a delay circuit to prevent the resumption of scanning during signal fades. A noise generator controlled by the variable response time squelch controls an audio muting squelch circuit in the receiver.

3,750,033

SYSTEM FOR RECEIVING ONE OF PARTICULAR CONTROL SIGNALS PRECEDED BY A COMMON START SIGNAL UNDER PROTECTION AGAINST STATIC NOISE

Masao Fukata, 2-10-14, Shimorenjaku, Mitaka-shi, Tokyo-to, Japan

Filed Aug. 10, 1971, Ser. No. 170,522
Claims priority, application Japan, Aug. 10, 1970, 45/69289
Int. Cl. H04b *1/10*
U.S. Cl. 325—478 **5 Claims**



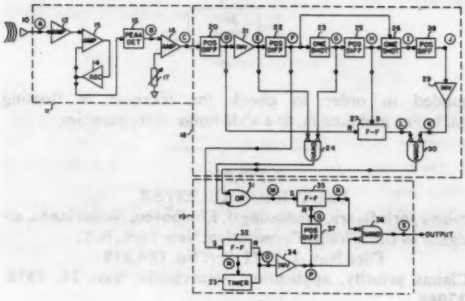
A system for receiving a control signal formed in sequence by a common start signal and one of particular control signals by the use of a first decision circuit for detecting the common start signal and a second decision circuit operational after the first decision circuit receives the common start signal, in which a third decision circuit responsive to a statice noise component included in the control signal is provided in parallel with the second decision circuit so that the particular detection of the control signal can be performed in disregard of static noise in a fail-safe manner.

3,750,034

SYSTEM FOR DETERMINING WHETHER A SIGNAL LIES WITHIN A SELECTED FREQUENCY BAND

Ronald R. Marucci, East Northport, and Santo C. Galatioto, Richmond Hill, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed May 28, 1971, Ser. No. 147,908
Int. Cl. H03k *5/20*
U.S. Cl. 328—110 **6 Claims**



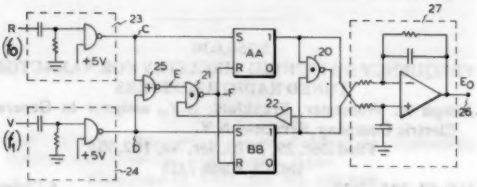
Disclosed is a system for receiving and detecting propagated mechanical-wave analog signals in which the analog signals are converted to a digital signal wherein pulse spacing is proportional to the corresponding instantaneous frequency of the detected mechanical wave signals. A digital processor compares the pulse-spacing of successive pulses of the incoming digital signal with selected pulse-spacing limits corresponding to the frequency limits of the selected bandwidth, and an output signal is generated indicating the receipt of analog signals within the selected frequency band whenever all of the successive pulses during a sampling interval lie within the selected pulse-spacing limits. Generation of an output signal is inhibited when any pair of successive pulses has a pulse spacing outside of the pulse-spacing limits during the sampling interval.

3,750,035

FREQUENCY DISCRIMINATOR AND PHASE DETECTOR CIRCUIT

Robert Bruce Crow, Sierra Madre, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed May 3, 1971, Ser. No. 139,596
Int. Cl. H03b *3/04*
U.S. Cl. 328—133 **10 Claims**

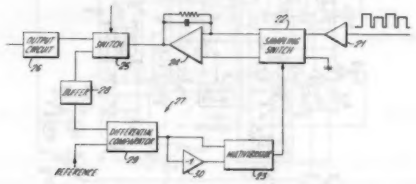


Frequency discriminator and phase detector circuits are disclosed, each having two flip-flops, one flip-flop for each of two signals to be compared, and means for causing one flip-flop to be set the majority of the time in proportion to the extent to which one signal differs from the other in frequency or phase, and means for integrating the difference between output waveforms of the flip-flops to obtain an output signal E_o which can be used to adjust the frequency and phase of a variable signal V with respect to a reference signal R.

3,750,036
AUTOMATIC CONTROL

Philip Richard Miles Burrows, Sevenoaks; Ian McGrath Raymond, Gravesend, and Michael Peter Alwyn Terry, Rainham, all of England, assignors to Reed International Limited, London, England

Filed Oct. 21, 1971, Ser. No. 191,189
Claims priority, application Great Britain, Oct. 21, 1970, 50,024/70
Int. Cl. H03k 5/00; G06g 7/18, 7/12
U.S. Cl. 328—151 8 Claims

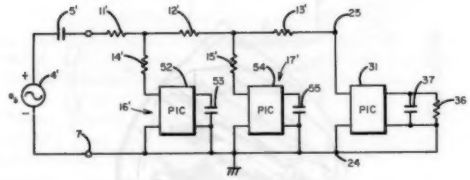


A signal representative of the magnitude of a variable is generated and is adjusted in dependence upon a control signal by sampling the signal representative of the variable at predetermined intervals, varying the sampling period in dependence upon changes in the control signal, and integrating the sampled signal to derive a signal which varies as a function of both the amplitude and width of the sample pulses.

3,750,037
INDUCTORLESS LOWPASS FILTER UTILIZING FREQUENCY DEPENDENT NEGATIVE RESISTORS

Charles E. Schmidt, Woodside, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 20, 1971, Ser. No. 145,140
Int. Cl. H03h 7/02, 11/00
U.S. Cl. 328—167 8 Claims

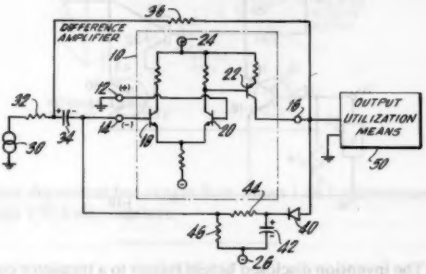


A given lowpass antisynametrical ladder filter of even degree having only a capacitor in the output branch thereof that is connected to ground and is shunted by a load resistor is transformed to an equivalent inductorless network by simulation techniques wherein each inductor, resistor and capacitor of the given filter is replaced with an associated resistor, capacitor, and frequency dependent negative resistor (FDNR), respectively. The equivalent network has a pair of output terminals, one of which is grounded, with the parallel combination of a capacitor and an FDNR connected therebetween. This combination is simulated by a Riordan circuit having one port connected to the output terminals of the equivalent network and another port terminated by the parallel combination of a resistor and a capacitor which are connected to ground.

3,750,038
AMPLIFIER CIRCUIT FOR COINCIDENTALLY PROVIDING SIGNAL CLAMPING OPERATION

William H. Meise, Southampton, Pa., and Henry B. Marron, Moorestown, N.J., assignors to Jerrold Electronics Corporation, Philadelphia, Pa.

Filed Nov. 12, 1971, Ser. No. 198,351
Int. Cl. H03f 21/00
U.S. Cl. 330—11 7 Claims

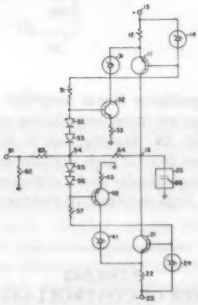


A video amplifier for coincidentally clamping synchronizing pulse peaks (tips) to a reference potential to effect direct current restoration employs a difference amplifier with alternating and direct current feedback network paths. The d.c. feedback structure includes a periodically enabled diode-capacitor network for establishing the circuit clamping potential, while the difference amplifier and the operatively distinct a.c. feedback circuitry function in an operational amplifier mode to amplify the video intelligence.

3,750,039
CURRENT STEERING AMPLIFIER

Roy M. Williams, Jr., Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 27, 1969, Ser. No. 811,093
Int. Cl. H03f 3/04
U.S. Cl. 330—13 11 Claims

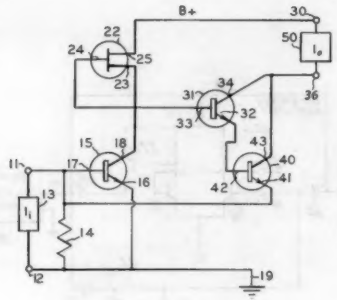


The output circuit, or load, is connected to draw current from either one of two constant current sources of opposite polarity. A pair of auxiliary circuits have their conductivity differentially controlled by the input signal. These circuits are connected so that as one steers current from one source away from the load and through itself, the other steers current from the other source away from itself and into the load.

3,750,040
TRANSISTOR DELAY LINE DRIVER

James D. Weir, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1972, Ser. No. 265,089
Int. Cl. H03f 3/04; H03g 3/30
U.S. Cl. 330—24 6 Claims

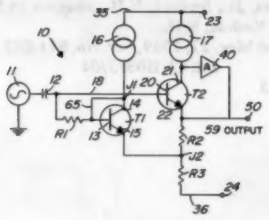


The invention disclosed herein relates to a transistor current amplifier usable as a delay line driver. The current amplifier incorporates a high gain amplifier including a transistor, a Field Effect Transistor (FET), and two Darlington-connected transistors providing the bias current through the resistor for the first transistor and feedback current through the resistor.

3,750,041
ACTIVE BOOTSTRAP CIRCUIT

Michael J. Gay, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 17, 1972, Ser. No. 227,173
Int. Cl. H03f 1/38
U.S. Cl. 330—26 8 Claims



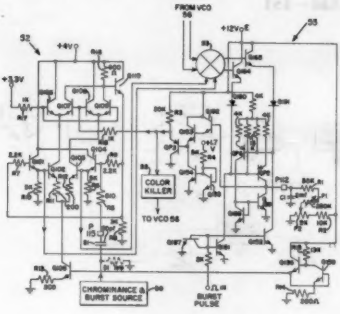
A high input impedance linear amplifier is disclosed. The amplifier circuit has an input impedance resistance which is designed for proper DC biasing, but is too low to accommodate an AC input from a high impedance source. The circuit, through a voltage divider and a semiconductor, effectively provides a very high dynamic impedance to the incoming AC signal.

3,750,042
AMPLIFIER OF CONTROLLABLE GAIN

William Peil, North Syracuse, and Robert J. McFadyen, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,451
Int. Cl. H03g 3/30
U.S. Cl. 330—29 6 Claims

A voltage controlled A.C. amplifier is described particularly suited for automatic gain control applications and in particular to automatic color control in a color television receiver. The amplifier is adapted for IC fabrication, with D.C. coupling throughout, having a minimum pin count, and a minimum of outboarded components. While the A.C. signal gain of the amplifier is controllable by voltage adjustment, the D.C. gain is substantially unity. The amplifier takes the form of a modified four-quadrant multiplier with two upper rank differentially connected transistor pairs whose emitters are driven by a lower rank differentially connected transistor pair, the latter preferably flanked by a pair of emitter followers. The input

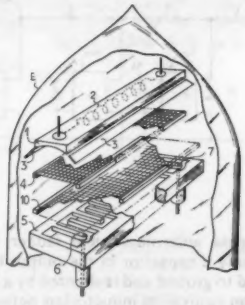


signal is normally applied to the base of one flanking emitter follower through a high pass coupling network. The gain control function is achieved by selective regenerative or degenerative feedback controlled by the interbase potential applied to the upper rank transistor pair. The feedback is applied to the lower rank transistors through a feedback network which is balanced for D.C. but which has a differential affect for A.C. and in particular a low pass coupling characteristic to the lower rank transistor to which the input signal is coupled.

3,750,043
HIGH FREQUENCY ELECTRONIC DEVICES

Bernard Epsztein, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 13, 1971, Ser. No. 162,112
Claims priority, application France, July 30, 1970, 7028232
Int. Cl. H03f 3/58
U.S. Cl. 330—43 12 Claims



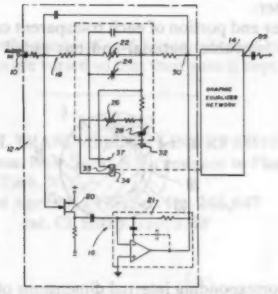
An electronic device wherein an interaction of an electron beam and a high frequency wave propagating through a delay line is achieved. The electron beam is made to strike substantially the whole length of said delay line simultaneously, which line upon this strike emits secondary electrons which are collected either by a grid parallel to the delay line or by the surface itself of said line.

Such devices constituting either electronic amplifier or storage tubes.

3,750,044
GRAPHIC EQUALIZER CIRCUIT

Gerald R. Stanley, Mishawaka, Ind., assignor to International Radio & Electronics Corporation, Elkhart, Ind.

Filed May 22, 1972, Ser. No. 255,428
Int. Cl. H03f 3/68
U.S. Cl. 330—126 13 Claims

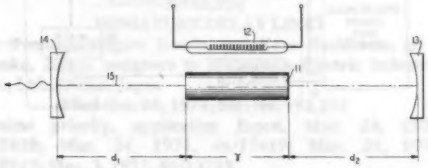


A graphic equalizer system for an audio amplifier system includes an input circuit for adjusting bass and treble boost and the corner frequencies thereof. The input circuit is coupled to a graphic equalizer network which in one branch includes a main amplifier connected between input and output terminals. Another branch includes a resistive voltage divider connected in series between input and output terminals and having multiple outputs for connection by a crossbar switch to any of a plurality of tuned active filter circuits each of which is tunable to a different frequency. The outputs of the filter circuits are coupled to a summing amplifier for connection to the input of the main amplifier of the graphic equalizer network.

3,750,045
LONGITUDINAL MODE STABILIZATION IN LASERS

David Allison Draegert, Madison, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed June 1, 1971, Ser. No. 148,802
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 C 4 Claims



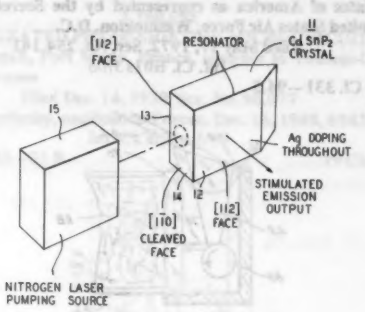
The longitudinal mode spectrum of a laser is simplified and stabilized by making the distance from each laser cavity mirror to the adjacent end of the laser medium an integral multiple of x, where x is the optical path length of the medium.

3,750,046
SILVER-DOPED CADMIUM TIN PHOSPHIDE LASER

Ernest Buehler, Chatham; Joseph Leo Shay, Marlboro, and Jack Harry Wernick, Madison, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 13, 1971, Ser. No. 179,906
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 H 6 Claims

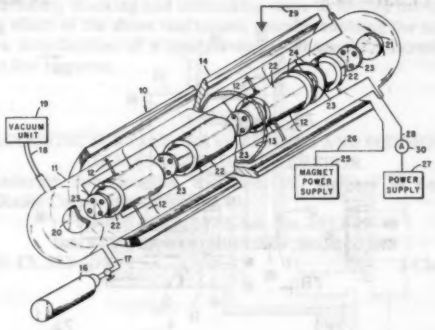
There is disclosed a semiconductor laser employing silver-doped cadmium tin phosphide, from which unexpectedly low-threshold and efficient laser action has been obtained. Both optically pumped and current injection embodiments are disclosed. Laser oscillation occurs in a narrow band that is temperature dependent but ranges from about 1.012 micrometers to about 1.016 micrometers.



3,750,047
GAS LASER HAVING EXCITATION CHAMBERS WITH MULTIPLE CHANNELS

Verle A. Gilson, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Aug. 25, 1972, Ser. No. 283,692
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 3 Claims



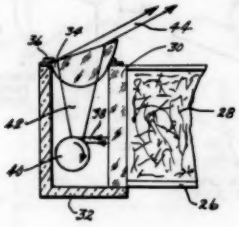
A gas laser excitation apparatus including means for providing an axial magnetic field and a plurality of electrodes within the laser cavity defining multiple axially adjacent excitation chambers or sections. Each excitation chamber or section is formed by two spaced parallel annular cathodes of equal radius with a coaxial tubular anode therebetween, each cathode being provided with a plurality of apertures. Successive chambers may share common cathodes so that the apparatus has alternately spaced cathodes and anodes. A potential difference applied between the anodes and cathodes causes electrons to make spiraling paths and undergo high frequency oscillations along axial magnetic field lines causing comparatively long electron lifetimes within each chamber, thereby increasing the probability of exciting particles contained therein. The plurality of apertures in the cathodes are aligned allowing a corresponding number of light beams to pass through annular channels of the excitation chambers where most gas particles in an excited state appropriate for lasing are present thereby producing a physically short but effectively long tube.

3,750,048

WINDOW FOR HIGH POWER GASEOUS LASERS

Jacques E. Ludman, Westford, Mass., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed May 17, 1972, Ser. No. 254,141
Int. Cl. H01s 3/08
U.S. Cl. 331—94.5 2 Claims



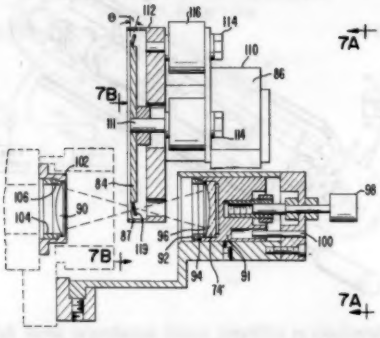
In a gas laser capable of ultra high power, a cylindrical mirror mounted to receive the laser beam, diverge it, thereby lowering the power density. A cylindrical lens, acts as the seal and window, receives and transmits the beam causing it to reform outside of the container without the need of further optics.

3,750,049

LASER TRIMMING TOOL

Mark W. Dowley, 333 Byron St.; Wayne S. Mefferd, 2479 Chabot Ter., both of Palo Alto, and Robert J. Rorden, 24401 Summerhill Ave., Los Altos, all of Calif.

Filed Sept. 30, 1970, Ser. No. 76,684
Int. Cl. H01s 3/11
U.S. Cl. 331—94.5 2 Claims



A laser trimming tool includes a laser, means for directing the output beam from the laser onto the workpiece being trimmed, and a gas jet directed obliquely at the workpiece in the region of the intersection with the laser beam during the trimming operation. An improved Q-switch, forming an integral part of the laser cavity, is used to provide a pulsed beam output. To insure that the proper amount of the workpiece is trimmed, a fast response resistance level detector is used.

3,750,050

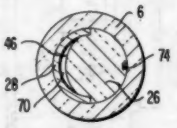
LASER ASSEMBLY

Wayne J. Zitkus, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 26, 1971, Ser. No. 128,552
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 D 9 Claims

A plurality of disks include solid laserable material and are in parallel spaced apart relation within a transparent tubular enclosure. Spaces between the disks constitute portions of a coolant fluid passage within the tubular enclosure. Transparent end members at the opposite ends of the tubular enclosure are located in the path of radiant energy emitted by the laserable material. Coolant fluid passes radially through an exterior sleeve which encircles the end of the tubular enclosure. Sealing means are located between the exterior sleeve and the outside surface of the tubular enclosure. Adjustment means on the exterior sleeve urge a second sealing means against an axially outwardly facing surface of each transparent end member.

The inner end portion of each transparent end member confronts the laserable material and has radial dimensions less



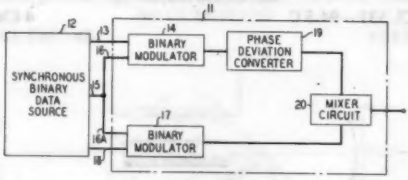
than the corresponding internal dimensions of the tubular enclosure. A spacer sleeve is telescopically fitted over the inner end portion and extends axially therebeyond to provide a coolant passage space between the inner end portion and the laserable material. The coolant passage also includes a portion formed by an axially-extending radially-relieved portion of the transparent end member which extends along the transparent end member and inside the spacer sleeve. The outer portion of the transparent member includes a plug portion which conforms to the inside dimensions of the tubular enclosure to reduce the risk of coolant fluid leakage.

3,750,051

MULTI-LEVEL MODULATOR FOR COHERENT PHASE-SHIFT KEYED SIGNAL GENERATION

Douglas MacPherson Brady, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 12, 1972, Ser. No. 243,319
Int. Cl. H04l 27/20
U.S. Cl. 332—9 R 14 Claims



A modulator for developing a frequency modulated coherent phase-shift keyed signal having two or more phase deviations. The modulator comprises a mixer circuit which mixes first and second two-level frequency modulated phase-shift keyed signals to develop the above-indicated multi-level signal.

3,750,052

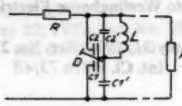
ADJUSTABLE FREQUENCY-DEPENDENT EQUALIZER

Peter Hermanutz, Schoeckingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,425
Claims priority, application Germany, Dec. 11, 1970, p 20 61 119.2
Int. Cl. H03h 7/10, 7/14; H01p 1/22
U.S. Cl. 333—28 R 18 Claims

In an adjustable frequency-dependent equalizer for correcting the distortions at the ends of the passband of a filter, which

equalizer has an L-, a T- or a bridget T-configuration and comprises a series-resonant circuit, a capacitance is connected in



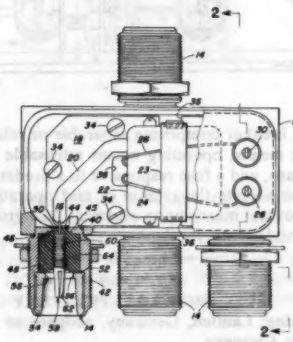
parallel to the inductance of said series-resonant circuit. The two capacitances are varied so that their sum is kept constant.

3,750,053

COAXIAL TRANSMISSION LINE RF SWITCH

Daniel A. LeDonne, New York, N.Y., assignor to Plessey Incorporated, New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,647
Int. Cl. H01p *1/10, 3/08*
U.S. Cl. 333—7 **9 Claims**



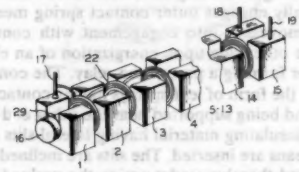
A transmission line switch for general use at frequencies to 400 MHz and in certain applications to 1000 MHz, featuring strip-line circuitry. Specifications heretofore met only by more expensive switches are achieved with refined circuit design and improved lead support.

3,750,054

MINIATURE DELAY LINE

Toru Tamura; Shigeru Kondo, and Kozo Hashimoto, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1971, Ser. No. 192,224
Claims priority, application Japan, Mar. 24, 1971, 46/17418; Mar. 24, 1971, 46/17419; Mar. 31, 1971, 46/19917; Mar. 3, 1971, 46/13719
Int. Cl. H03h
U.S. Cl. 333—29 **9 Claims**



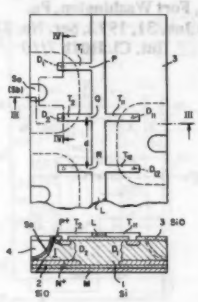
A delay line for use at high frequencies. The delay line has a core having a core member with at least one pair of flanges therein. A silver paint layer covers the plastic core, and a multiturn coil of a resin-coated wire is wound on the core between the flanges. Terminals are provided on the core appropriately connected to the wire of the coil and to the silver paint layer, and the core and coil are enclosed in a housing.

3,750,055

INTEGRATED PHASE-SHIFTING MICROCIRCUIT

Ronald Funck, Port Marly, France, assignor to Thomas-CSF, Paris, France

Filed Dec. 14, 1970, Ser. No. 98,077
Claims priority, application France, Dec. 16, 1969, 6943512
Int. Cl. H01p *1/18*
U.S. Cl. 333—31 R **19 Claims**



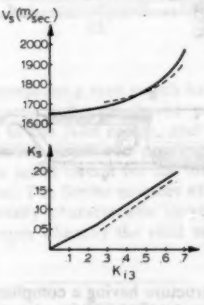
A phase shifter for microwaves is monolithically formed from a silicon panel with a grounded metallic bottom layer and a metallic top layer defining a central conductor strip longitudinally subdivided into several line segments by junctions with reactive shunts spaced a quarter wavelength apart. Each shunt path includes the series combination of a condenser and a diode both integral with the monobloc panel. Successive diodes are provided, in pairs, with common biasing leads for alternately blocking and unblocking same to modify the loading effect of the shunt reactances, thereby enabling the selective introduction of a predetermined phase-shift increment per line segment.

3,750,056

ACOUSTIC SURFACE-WAVE FILTERS AND METHODS OF MANUFACTURE THEREFOR

Sundaram Subramanian, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 10, 1972, Ser. No. 233,649
Int. Cl. H03h *9/14;* **H01v** *7/02;* **B65d** *63/08*
U.S. Cl. 333—72 **3 Claims**



A surface-wave filter has a wave-propagating medium of ferroelectric material that exhibits a rate of change of surface-wave velocity which increases with increasing degree of poling more rapidly than its surface-wave coupling factor increases as the poling level is raised. The ultimate transducer interaction efficiency is a function of the coupling factor. Moreover, the material is poled in an amount that effects a desired surface-wave velocity while, at the same time, producing a sur-

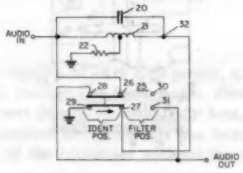
face-wave coupling factor that is significantly less than that corresponding to an optimum value with respect to transducer interaction efficiency. Completing the structure, an input transducer serves to launch acoustic surface waves and an output transducer responds to those waves by developing an output signal.

3,750,057

SWITCHABLE BAND PASS-BAND REJECT FILTER APPARATUS

John F. Smith, Warminster, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Jan. 31, 1972, Ser. No. 222,245
Int. Cl. H01h 7/10
U.S. Cl. 333—76 **3 Claims**



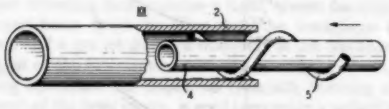
A frequency selective circuit switchable to provide alternately a band reject or band pass response, comprising a filter circuit connected to a double pole double throw switch so that in a first position a frequency band is attenuated while frequencies above and below the center of the band are passed, and in a second position a band about the same center is passed with a sharp drop-off in response both above and below the passband.

3,750,058

WAVEGUIDE STRUCTURE UTILIZING COMPLIANT HELICAL SUPPORT

Jon Calvin Bankert, Jr., Mendham; Milton Lutchansky, Dover; Nicholas Osifchin, Kinnelon, and Clarence Jesse Willis, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1971, Ser. No. 205,796
Int. Cl. H01p 1/16, 3/12
U.S. Cl. 333—95 R **6 Claims**



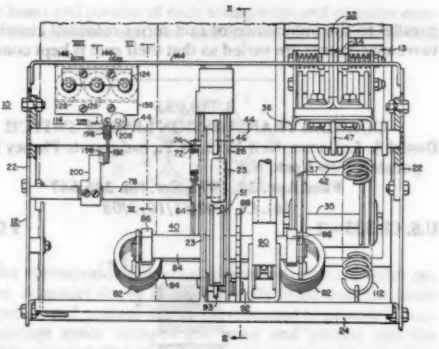
A waveguide structure having a compliant effectively continuous support is obtained by wrapping an elongated compliant member such as a rubber tube, a stranded compliant member or a coiled wire around a waveguide in a helical or braided pattern and then inserting the waveguide into a conduit. The pitch of the helix, the elastic modulus of the material, and wall thickness of the compliant member can be varied to change the stiffness of the support and to minimize electrical losses due to both weight loading induced deflections and deflections caused by earth forces on the conduit.

3,750,059

CIRCUIT INTERRUPTING APPARATUS

Nagar J. Patel, Pittsburgh, and George Siviy, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1972, Ser. No. 276,289
Int. Cl. H01h 73/48
U.S. Cl. 335—142 **11 Claims**



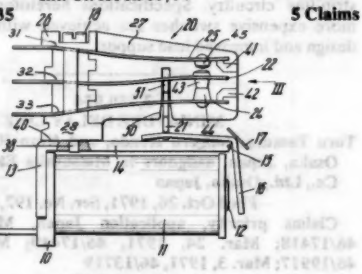
A circuit breaker comprising separable or relatively movable contact means, operating means releasable to open said contact means, and a fuse responsive to a predetermined current level to actuate the release of said operating means to open said contact means upon a current flow greater than the predetermined current level.

3,750,060

ELECTROMAGNETIC RELAY

Hans Pfenning, Lauffen, Germany, assignor to Bach & Co., Heilbronn, Germany

Claims priority, application Germany, Apr. 22, 1971, P 21 19 734.2
Filed Apr. 20, 1972, Ser. No. 245,739
Int. Cl. H01h 63/04
U.S. Cl. 335—135 **5 Claims**



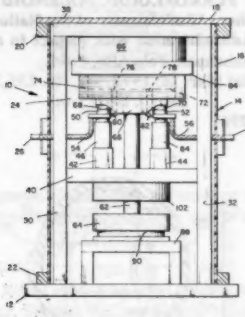
An electromagnetic relay in which center contact spring means normally engages outer contact spring means on one side and is moveable into engagement with contact spring means on the other side upon energization of an electromagnetic actuator forming a part of the relay. The contact spring means are in the form of leaf springs having contact elements at one end and being supported near the other end by a block of electrical insulating material having lateral slits into which the spring means are inserted. The slits are inclined relative to each other and thereby predetermine the preload on the individual spring means. The block has at least one wall portion projecting therefrom which has abutment elements interposed between the center spring means and the outer spring means to limit the movement of the latter toward the former. Advantageously, each contact spring means is in the form of a pair of laterally spaced springs between which the aforementioned wall is disposed.

3,750,061

HIGH-SPEED SWITCH DEVICE

Noel E. Reed, Studio City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 22, 1972, Ser. No. 255,665
Int. Cl. H01h 9/20
U.S. Cl. 335—168 17 Claims



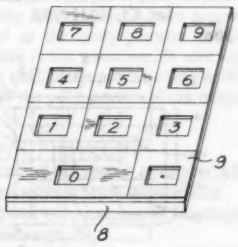
High-speed switch device is capable of providing continuous current carrying capability with its contacts closed, and is capable of rapidly opening for current cessation therethrough. The device is particularly adapted for acting as a portion of a high voltage DC circuit breaker, so that the opening of the switch transfers current into an impedance increasing section of the circuit breaker.

3,750,062

THIN-TYPE SWITCHBOARD

Mitsuhiro Goto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 16, 1971, Ser. No. 171,870
Claims priority, application Japan, Aug. 17, 1970, 45/71597
Int. Cl. H01h 41/08, 36/00
U.S. Cl. 335—206 1 Claim



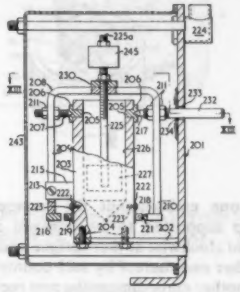
A thin-type switchboard having a plurality of reed switches each of which is adapted to be operated when subjected to a magnetic field, said reed switches being disposed substantially in a single plane beneath an operating surface. A separate manually positionable permanent magnet operates selected ones of said reed switches when positioned in registration therewith adjacent said operating surface.

3,750,063

LAYING OF CONCRETE KERBS, HAUNCHES AND THE LIKE

Michael David Lowen, London, and Alan Reginald Mountford, Borehamwood, both of England, assignors to John Laing Research & Development Limited, London, England

Division of Ser. No. 836,078, June 24, 1969, Pat. No. 3,636,833. This application Sept. 17, 1971, Ser. No. 181,320
Claims priority, application Great Britain, Sept. 3, 1968, 41,939/68; Sept. 3, 1968, 5,554/68
Int. Cl. H01h 36/00
U.S. Cl. 335—206 11 Claims



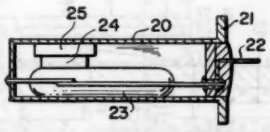
A displacement detecting device in which a pivoted carrier for two permanent magnets is located in relation to two magnetic switches so that in one carrier-limit position one magnet closes one switch but in the other limit position the other magnet closes the other switch, thereby to constitute a device for sensing deviations, e.g. from a datum wire so as to operate an automatic continuous concrete laying machine.

3,750,064

TEMPERATURE-OPERATED SWITCH

Umaki Kato; Masanori Endo, and Katsuo Kamata, all of Yokohama, Japan, assignors to Tohoku Metal Industries Limited, Miyaki-ken, Japan

Filed May 18, 1971, Ser. No. 144,617
Int. Cl. H01h 37/58
U.S. Cl. 335—208 6 Claims



A thermostat comprises a reed switch having a pair of normally open contacts, a barium-ferrite permanent magnet disposed parallel to the reed switch, and a manganese-zinc group ferrite member positioned proximate the permanent magnet to form a series circuit for the magnetic flux of the permanent magnet. The ferrite member exhibits a stauration magnetic flux density characteristic varying in response to temperature changes whereby the reed switch contacts are closed.

3,750,065

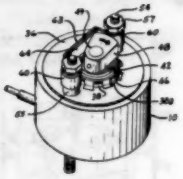
EXTERNAL STOP FOR ROTARY SOLENOID

John L. Myers, Dayton, Ohio, assignor to Ledex Inc., Dayton, Ohio

Filed June 28, 1972, Ser. No. 267,012
Int. Cl. H01f 7/14
U.S. Cl. 335—272 8 Claims

An external stop device for determining the starting and stopping positions of a freewheeling armature assembled in a

rotary solenoid housing, the armature applying a torque to a shaft having a portion projecting externally of the housing, said external stop device comprises a radially disposed arm affixed to the outwardly projecting portion of said shaft, said arm having a clockwise striker surface and counterclockwise striker surface, and a bumper means fixedly mounted to the exterior of said housing for intercepting said arm in clockwise movement thereof by contact with said clockwise striker surface and intercepting said arm on counterclockwise movement thereof by contact with said counterclockwise striker



surface. In one embodiment the bumper is an elongate resilient strip supported to be engaged adjacent one end thereof by said clockwise striker surface and to be engaged adjacent the other end thereof by said counterclockwise striker surface. In another embodiment the arm reciprocates between two spaced apart resilient bumper members and, for balance, the arm is elongated so as to project equally from diametrically opposite sides of said shaft, the arrangement being such that when one end of the arm contacts one bumper, the other end of the arm simultaneously contacts the other bumper.

3,750,066

SOLENOID FOR USE IN AN ENGINE STARTING MECHANISM

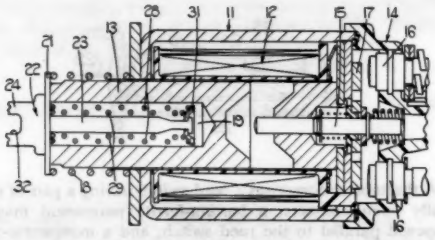
Allan William Lazenby, Shirley, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 3, 1971, Ser. No. 204,606

Claims priority, application Great Britain, Dec. 8, 1970, 58,161/70

Int. Cl. H01f 7/13

U.S. Cl. 335—274 **4 Claims**



An armature assembly for a solenoid for use in an engine starting mechanism the armature assembly being of the kind comprising a hollow armature a link member including a first part housed within the armature and a second part which protrudes from the armature and a resilient longitudinally compressible element within the armature and acting on the link member to resiliently resist withdrawal of the link member from the armature. The method includes the steps of slidably engaging a first abutment member with said first part of the link member the link member having an abutment intermediate its ends which limits relative sliding movement between the link member and the first abutment member in one direction. A pair of compression springs are then engaged with the link member and abut at one end against the first abutment member the springs are then compressed so that the end of the link member protrudes from the end of the springs remote from the first abutment member and a second abutment member is then engaged with the projecting portion of the link member to retain the springs in a compressed condition acting between the two abutment members. The first part of the link member carrying the springs is then inserted into the hollow armature and the first abutment member is secured to the armature.

3,750,067

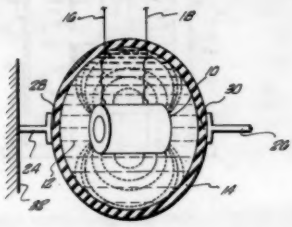
FERROFLUIDIC SOLENOID

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Eric E. Sabelman, Palo Alto, Calif.

Filed Mar. 16, 1972, Ser. No. 235,295

Int. Cl. H01f 3/00

U.S. Cl. 335—296 **11 Claims**



An electromechanical actuator for producing mechanical force and/or motion in response to electrical signals applied thereto, is disclosed. The actuator includes a ferromagnetic fluid and a coil which are contained within an elastomeric capsule. Energization of the coil by application of current to a pair of coil electrodes extending through the walls of the elastomeric capsule produces distortion of the capsule, i.e., radial expansion and axial contraction. This distortion is caused by the redistribution of the ferromagnetic fluid within the capsule under the influence of the magnetic field produced by the energized coil. Variation of the current input will produce corresponding variations in the degree of capsule distortion.

3,750,068

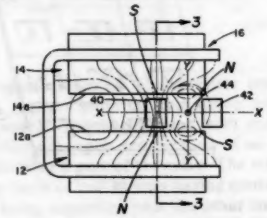
MAGNET ACTUATING ARRANGEMENT FOR A MAGNETO SENSITIVE DEVICE AND METHOD FOR PROVIDING

Robert W. Hallin, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 28, 1969, Ser. No. 880,718

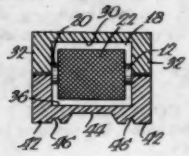
Int. Cl. H01f 7/02

U.S. Cl. 335—306 **3 Claims**



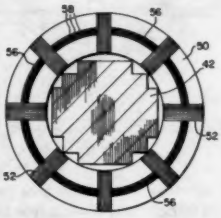
A magnet actuating arrangement for a magneto sensitive device which incorporates a pair of facing magnets, parallel spaced to accommodate the device in the air gap therebetween, with each magnet including an opposite pair of magnet poles on the facing surface thereof each pole so arranged as to be of opposite polarity with respect to the facing pole of the other magnet. The magnets may include a three-dimensional controlled flux pattern.

3,750,069
LOW RELUCTANCE INDUCTOR
John O. Renskers, Crystal Lake, Ill., assignor to Coilcraft, Inc., Cary, Ill.
Filed Feb. 22, 1972, Ser. No. 228,086
Int. Cl. H01f 27/24
U.S. Cl. 336—83 1 Claim



A closed magnetic circuit, high inductance device characterized by minimum reluctance and low cost of manufacture.

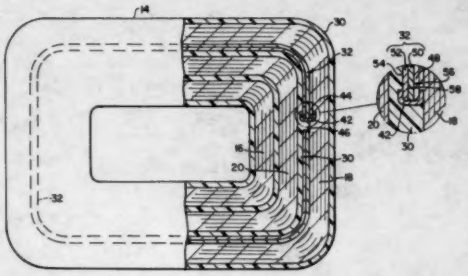
3,750,070
PRESSURE RING FOR TRANSFORMER WINDINGS
John C. Rissinger, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 30, 1971, Ser. No. 203,226
Int. Cl. H01f 27/24
U.S. Cl. 336—84 5 Claims



Pressure ring apparatus for securing the windings of power transformers. The pressure ring includes a body portion with magnetic radial members positioned therein to direct the leakage flux from the winding structure back into the magnetic core. The radial members are constructed from a plurality of metallic laminations which are stacked with their edges perpendicular to the leakage flux. Other magnetic members may be positioned in the body portion to help direct the leakage flux into the radial members. In one embodiment of this invention, one side of the pressure ring is stepped to conform to the shape of the yoke portion of the magnetic core.

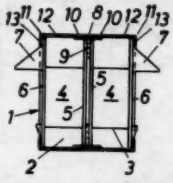
3,750,071
STRESS RELIEVING MEMBER FOR ENCAPSULATED TRANSFORMER WINDINGS
Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 5, 1972, Ser. No. 250,552
Int. Cl. H01f 15/04
U.S. Cl. 336—84 12 Claims

One or more layers of foil are positioned between the start conductor-turn of the outer low-voltage winding section and the encapsulating material. The foil prevents adherence of the encapsulating material to the start conductor-turn of the outer low-voltage winding section. This permits relative movement between the outer low-voltage winding section and the encapsulating material, thus preventing the formation of mechanical stresses. The foil layers are electrically connected to the start conductor-turn of the outer low-voltage winding section to eliminate corona discharges. The ends of the foil layers are



electrically insulated from each other to prevent the formation of a shorted turn within the winding assembly.

3,750,072
APPARATUS FOR INSULATING ADJACENT COILS IN AN ELECTRICAL COIL FORMER
Norbert Weiner, 5275 Bergneustadt-2, Pernze, Germany
Filed Dec. 29, 1971, Ser. No. 213,373
Claims priority, application Germany, Jan. 30, 1971, P 21 04 421.3
Int. Cl. H01f 27/30
U.S. Cl. 336—185 8 Claims

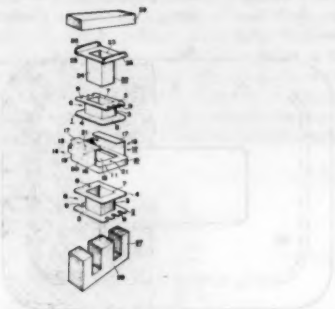


A coil former having a plurality of winding spools for electrical coils in which adjacent coils are insulated from each other by an annular insulating wall having perpendicular edges disposed over the ends of the winding spools to provide a high dielectric strength between the coils. Rectangular shaped insulating caps disposed over the top and bottom edges of the spools are also used for conventional coil former applications, while side shields slidably disposed over the side edges of the spools are sued with printed circuit boards.

3,750,073
COIL BOBBIN
Kohei Okano, Saitama, Japan, assignor to Kabushiki Kaisha Tamura Seisakusho, Tokyo, Japan
Filed May 26, 1972, Ser. No. 257,169
Claims priority, application Japan, July 29, 1971, 46/67391
Int. Cl. H01r 27/30
U.S. Cl. 336—198 6 Claims

This invention relates to a coil bobbin. Said coil bobbin comprises a pair of coil bobbin members identical in shape and each comprising a box-shaped body formed with flanges

at opposite ends of the body to define a coil chamber therebetween on the outer periphery of the body, and an insulat-

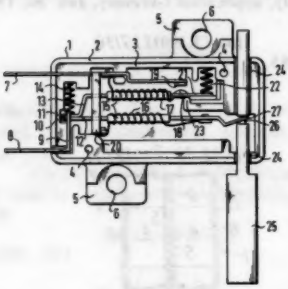


ing frame adapted to mount said pair of coil bobbin members on opposite sides thereof.

3,750,074
PLUNGER TYPE RELAY

Jakob Ellenberger, Altdorf, Germany, assignor to Ellenberger & Poensgen GmbH, Nurnberg, Germany

Filed Aug. 30, 1971, Ser. No. 176,031
Claims priority, application Germany, Sept. 10, 1970, P 20 44 787.4
Int. Cl. H01h *61/02, 71/16*
U.S. Cl. 337—77 **8 Claims**

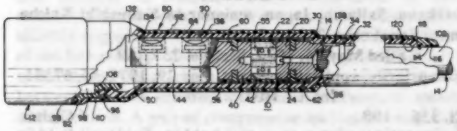


A plunger type relay for locking the door of a washing machine. Such a relay includes first and second bimetal strips, at least one heating winding for heating the bimetal strips, a fixed contact and a movable contact actuatable by the second bimetal strip to co-operate with the fixed contact to short circuit the heating winding.

3,750,075
CURRENT LIMITER SYSTEM

James Joseph Cooper, Jr., St. Louis, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 10, 1972, Ser. No. 216,687
Int. Cl. H01h *85/12, 85/14*
U.S. Cl. 337—158 **10 Claims**

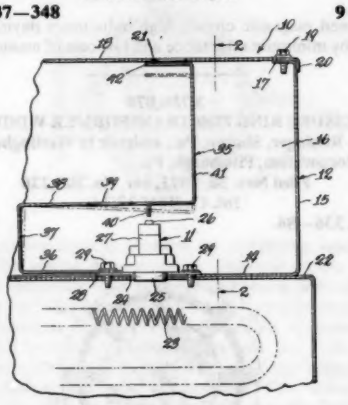


The improved current limiter system includes aluminum terminal connectors at each end, the one end capable of connection to conducting elements such as an aluminum bus connector and at the other end the limiter may be connected to an aluminum conductor such as an insulated cable. The number of electrical contact points between the limiter and its connections is reduced in number but not in available contact area, thereby to produce a maximum of heat transfer. The heat transfer characteristics of the limiter are further enhanced in that air pockets or voids within the enclosed connection are reduced and contact area is large. The limiter is capable of being sheathed in a suitable insulating jacket without the necessity of taping its connection to the cable or to the bus bar.

3,750,076
CONTROL BOXES

Burgess W. Hines, Kirkland, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 19, 1972, Ser. No. 290,396
Int. Cl. H01h *37/70*
U.S. Cl. 337—348 **9 Claims**

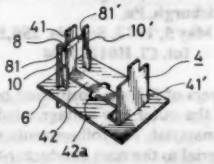


An enclosed control box, including a cover movably secured to the box to normally close a side thereof. The sensor of a thermostatic switch extends through an opening in a wall of the control box and senses heat within a heater housing. The switch has a reset button, and a strip of spring metal is secured within the housing and has one portion disposed adjacent to the reset button and another portion underlying an opening in the cover. The reset button is actuated when force is applied through the cover hole and against the underlying part of the spring metal strip, so that the cover need not be opened or removed to reset the switch.

3,750,077
CONTACTLESS SWITCHING APPARATUS

Seishiro Nishiba, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Ohtaku, Tokyo, Japan

Filed Sept. 25, 1972, Ser. No. 291,599
Claims priority, application Japan, Sept. 23, 1971, 46/87232
Int. Cl. H01c *7/16*
U.S. Cl. 338—32 R **13 Claims**



A contactless switching apparatus which is adapted to provide a switching output with variation of the magnetic flux being applied to a magnetro-resistance effect device provided

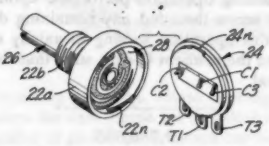
in the closed magnetic path formed by a magnet and U-shaped yoke due to shift of said magnetic path when a key top is depressed, wherein a U-shaped yoke and terminal pins are fixed on a base, the magnet being connected to the key top is provided between free-ended segments of said U-shaped yoke, said U-shaped yoke, terminal pins and magnet are housed in a switch case and said magnet is slid along guideways provided on the inside surface of the switch case and is returned by a spring member.

3,750,078

RADIO-FREQUENCY ATTENUATOR

Frank J. Bruder, Newport Beach, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Jan. 10, 1972, Ser. No. 216,683
Int. Cl. H01c 5/00
U.S. Cl. 338—150 **7 Claims**



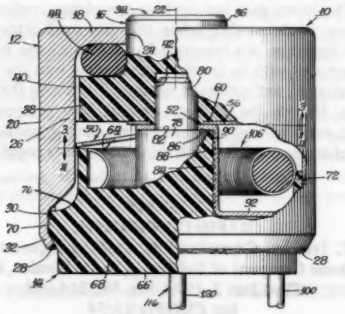
A simple single-turn attenuator device having a single rotor carrying three interconnected resistive elements on a high-temperature resistant ceramic rotor plate and positioned for simultaneous arcuate movement past respective wiper-terminal members fixed in the attenuator housing. The attenuator is adapted to replace ganged-potentiometer devices; and may include on the rotor a fixed-value resistor element in series with one of the resistive elements.

3,750,079

MINIATURE POTENTIOMETER WITH STOP RIB AND SEALING MEANS

Adolf R. Scheiterbauer, Munich, and Helmut Stickdorn, Neubiberg, both of Germany, assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 36,077, May 11, 1970, abandoned.
This application Dec. 2, 1971, Ser. No. 204,381
Int. Cl. H01c 5/02, 9/02
U.S. Cl. 338—164 **4 Claims**



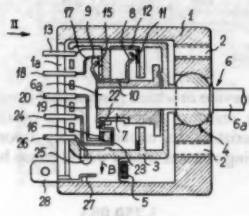
A miniature potentiometer including a housing having an integral internal rib forming a stop; a bottom plate assembly incorporating a resistance element and terminal contacts and having a groove receiving the rib and locking the bottom plate against rotation in the housing; and a rotatable carrier assembly carrying a contact spring engageable with the resistance element and having a projection engageable with the rib for limiting rotation of the carrier assembly.

3,750,080

WINDSCREEN WASHER AND WIPER TIMING CONTROL SWITCH HAVING A ROTATABLY MOUNTED CONTROL LEVER

Philippe Rouvre, and Francois Peroy, both of Billancourt, France, assignors to Regie Nationale Des Usines Ranault, Billancourt, France

Filed Aug. 23, 1971, Ser. No. 173,919
Claims priority, application France, Sept. 9, 1970, 7032712
Int. Cl. H05k 9/08
U.S. Cl. 338—172 **2 Claims**



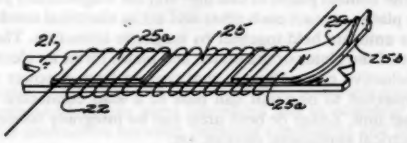
A combination windscreen washer and wiper timing control switch, characterized in that it comprises a control lever adapted to control, by rotation the windscreen wiper motor and, by tilting, the windscreen washer motor. Fixed case having tiltably mounted therein a body or box lever which forms a rod adapted to rotate about its axis in said box. Also provided is a pair of sliding contacts electrically interconnected and co-acting with contact studs or segments corresponding to the different rated speeds of the windscreen wiper motor. One of the segments comprises a resistive track engaged by one of the sliding contacts to form therewith a rheostat for adjusting the switch timing.

3,750,081

WIREWOUND VARIABLE RESISTANCE CONTROL AND METHOD OF MAKING THE SAME

Jack L. Miller, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed June 26, 1972, Ser. No. 265,965
Int. Cl. H01c 5/02
U.S. Cl. 338—174 **12 Claims**



Variable resistance control having wirewound resistance element with shorted end turns. A piece of metal secured to each end portion of an electrically nonconductive tape with a bonding material shorts several adjacent turns at each extremity of the resistance element.

3,750,082

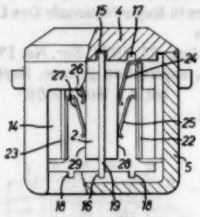
PLUG ASSEMBLY WITH RESISTOR

Poul Petersen, Havnbjerg, and Hans Kristian Pedersen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed June 15, 1972, Ser. No. 263,121
Int. Cl. H01c 1/02
U.S. Cl. 338—220 **12 Claims**

The invention relates to a plug assembly for a small refrigerating unit or the like which plug assembly is equipped with one or more PTC resistors. Thermally loaded, ceramic resistors such as PTC resistors are generally brittle and have

the characteristics of a substantial temperature expansion coefficient while being relatively weak structurally. The plug assembly accommodates one or more PTC resistors with a resistor holding device in which resiliently biased electrical contacts hold the resistors firmly in fixed positions while permitting the resistors to expand freely upon being heated without incurring stresses which would cause breakage.



3,750,083

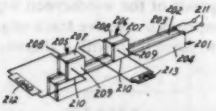
MAGNETIC ELECTRIC CONNECTOR

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 775,625, Nov. 14, 1968, Pat. No. 3,654,853. This application June 22, 1970, Ser. No. 59,812

Int. Cl. H01r *11/30*

U.S. Cl. 339—12 R **1 Claim**



This invention is directed to magnetic electric connectors. Each connector is composed of at least two units. The first unit is comprised of a nonconductive permanent magnet partially encased by electrically conductive contact plates bonded or form fitted to the magnet. The second unit may be of similar construction or conversely comprise a magnetically permeable electrically conductive platen of desired configuration. When connected, the contact plates of two similar units or the contact plates of one unit and the magnetically permeable platen contact each other and act as electrical conductors. The units are held together by magnetic attraction. The juncture of the plates or the platen and plates forms an electrically conductive connection so that current from a power source connected to one unit can pass to a load connected to the other unit. Either or both units can be integrally formed with electrical appliances, devices, etc.

3,750,084

HIGH VOLTAGE ELECTRICAL CONNECTOR LEAD ASSEMBLY

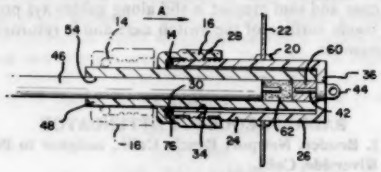
Mervin Amos Gardner, Highspire, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 17, 1972, Ser. No. 244,570

Int. Cl. H01r *13/54*

U.S. Cl. 339—61 R **6 Claims**

A high-altitude, high-voltage electrical connector lead assembly having an externally threaded bushing containing a contact pin, and an external electrical lead containing a contact pin socket. Surroundingly engaging, but longitudinally movable upon the exterior surface of the electrical lead in tightly-fitting fashion is an internally threaded flexible cap. Upon assembling the connector assembly, the lead, with its flexible cap, is grasped so as to insert the end of the lead containing the contact pin socket into engagement with the bushing contact pin. When the socket and pin are thus engaged, the flexible cap is then pushed or slid along the exterior surface of the lead, the flexibility of the cap permitting its internal threads to flexurally "skip" over the external threads of the bushing. A resilient O-ring is also positioned on the external lead, the O-ring being located between the interior face of the flexible cap and the annular end of the bushing. Upon completion of the pushing operation performed upon the cap, the latter may be screw-threaded any remaining distance along the bushing, this operation serving to axially compress and radially expand the resilient O-ring, such that the latter forms a fluid-tight seal.



3,750,085

PLUG AND SOCKET CONNECTORS AND SOCKETS THEREFOR

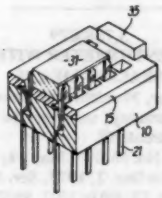
Frederick David Cooper, Runcorn, England, assignor to S.D.C. Products (Electronics) Limited, Runcorn, England

Filed Mar. 11, 1971, Ser. No. 123,363

Claims priority, application Great Britain, Aug. 18, 1970, 39,655/70

Int. Cl. H01r *13/54*

U.S. Cl. 339—75 M **5 Claims**



An electrical connector for an integrated circuit package comprising two parts movable toward and away from each other. The lower part has cavities containing resilient contact which are made to flex when the two connector parts are brought together. An integrated circuit package is placed in the upper part with its terminals extending into the cavities in the lower part, and pressure is applied to bring the two parts together, flexing the socket contacts into pressure contact with the terminals of the integrated circuit package. Hook type latches are provided to hold the two parts together.

3,750,086

RAPID CONNECTOR

Ralph T. Iversen, Granada Hills, Calif., assignor to General Telephone Company of California, Santa Monica, Calif.

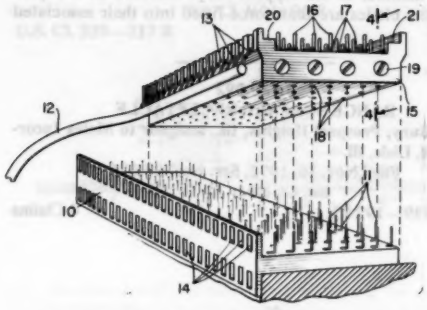
Filed Jan. 3, 1972, Ser. No. 214,645

Int. Cl. H01r *13/54*

U.S. Cl. 339—75 M **7 Claims**

A rapid connector is utilized to effect electrical connections between individual wire ends from a multi-conductor cable to terminal pins on a terminal block such as might be located in a central telephone office. The connector comprises an insulative body having a plurality of wire receiving pins on one side to which the wire ends of the multi-conductor cable are connected at the factory or during the manufacture of the body. The other side of the body includes a plurality of terminal pin receiving openings. The cable pins extend into the body and

terminate in spring fingers adjacent to the terminal pin receiving openings and cam means are provided for camming the spring fingers simultaneously into electrical contact with the terminal pins after the terminal pins have been received in the



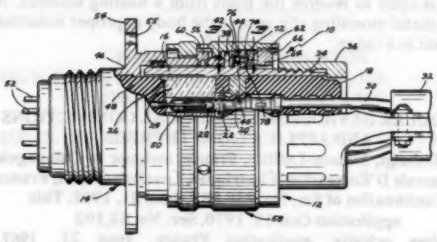
terminal pin receiving openings. Those openings are free of obstructions when the cam means are in unlocked position so that a large number of pins from the board can simultaneously be received in the pin openings with a minimum of friction.

3,750,087

PRELOADED ELECTRICAL CONNECTOR

Ottomar H. Vetter, Minneapolis, Minn., assignor to TRW, Inc., Minneapolis, Minn.

Filed Oct. 26, 1971, Ser. No. 192,040
Int. Cl. H01r *13/54*
U.S. Cl. 339—90 R **16 Claims**



Helical ramp grooves formed in the interior of a coupling ring act against bayonets or pins mounted on one half of the electrical connector to effect coupling with the other half. A specially tapered spring washer becomes effective during the coupling procedure to maintain a no-motion condition of the two components after the contacts thereof have been fully mated. Additionally, a plurality of detent balls are automatically shifted into a holding position at the completion of the coupling action, thereby further contributing to the maintenance of the mated or coupled condition of the connector parts.

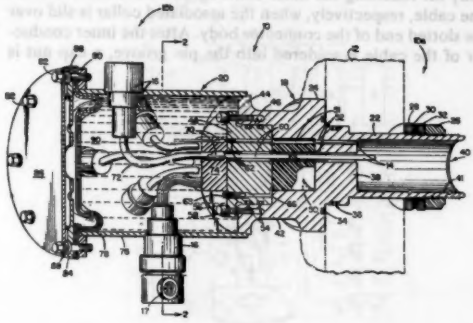
3,750,088

HIGH PRESSURE ELECTRICAL FEED-THROUGH FITTING

Albert G. Berian, Reading, Mass., assignor to D.G. O'Brien, Inc., Framingham, Mass.

Continuation-in-part of Ser. No. 114,138, Feb. 10, 1971, abandoned. This application Sept. 23, 1971, Ser. No. 183,176
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 A **15 Claims**

A high pressure electrical feed-through fitting, such as for providing connections between electrical cables in an underwater environment and the interior of a vessel, has a pressure-barrier section that feeds electrical conductors through the vessel hull and seals the ambient underwater pressure from the vessel interior. The electrical conductors pass from the pressure-barrier section to the interior of a closed, fluid-filled junction box section that has a diaphragm wall element which



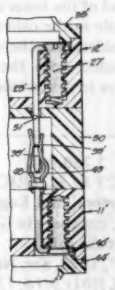
flexes to maintain the pressure within the junction-box sectin at a known level relative to the ambient pressure. A pressure biasing element can maintain a pressure differential between the interior of the junction box section and the ambient.

3,750,089

SERVICE CORD FITTING AND CONNECTOR

Marvin A. Clark, 7902 Woodley Ave., Van Nuys, Calif.

Filed Aug. 10, 1971, Ser. No. 170,493
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R **11 Claims**



A service cord fitting and coupling having solderless means cooperating to hold the parts assembled and to complete an electrical connection between insulated conductors and both the male and female electrical contactors.

3,750,090

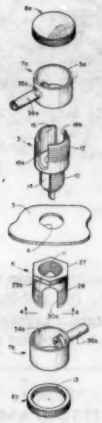
SHIELDED RIGHT-ANGLE PANEL MOUNT COAXIAL CONNECTOR

Zale E. Teman, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Continuation-in-part of Ser. No. 139,647, May 3, 1971, abandoned. This application July 5, 1972, Ser. No. 269,010
Int. Cl. H02b *1/02*; H01r *17/04*
U.S. Cl. 339—130 C **16 Claims**

A pair of coaxial cables are interconnected by attaching a tubular sleeve, which extends through and is secured in the wall of a cylindrical collar, to one end of each cable. Electrical connection to the outer conductor braid of each cable is accomplished by sliding a tubular sleeve under the braid, with the bared inner conductor of the cable extending into the center of the associated collar, and crimping a ferrule over the tubular sleeve and braid. A connector body having a center

conductor pin dielectrically mounted therein and an open-ended slot through the wall thereof is secured in a panel by a nut having a tubular portion that is coaxial with the pin and also has a slot through the wall thereof. A diagonal groove in one end of the pin is aligned with the slot in the connector body for receiving the inner conductor and tubular sleeve on one cable, respectively, when the associated collar is slid over the slotted end of the connector body. After the inner conductor of the cable is soldered into the pin groove, a cap nut is



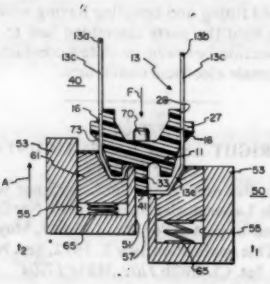
threaded onto the slotted end of the connector body tightly against the collar to rigidly and nonrotatably secure the one cable in the connector. Similarly, the collar on the other cable is slid over the tubular portion of the nut with the sleeve in the slot thereof and a bent end of the inner conductor of the other cable in a longitudinal hole in the other end of the pin. After this inner conductor is soldered to the other end of the pin, a second cap nut is threaded onto the tubular portion and tightened against the collar to shield this connection of the pin to the second cable.

3,750,091

MULTIPLE CONTACT ELECTRICAL CONNECTOR

Kent G. Blackman, Sycamore, and Eugene R. Hrdlicka, Elmwood Park, both of Ill., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Mar. 27, 1972, Ser. No. 238,144
Int. Cl. H01r *9/16, 13/50*
U.S. Cl. 339—176 M **1 Claim**



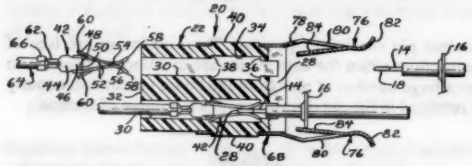
A dielectric contact support body including a plurality of separate contact blades conveniently arranged in two opposite and spaced rows and mounted on the support body through reception within associated apertures and through wedge fitting reception thereof within associated recesses of the support body. In a preferred method of manufacture, the support body is formed with a pair of recesses separated by a shoulder member and the contact blades are formed into a U-shaped matrix having a linking web portion disposed in the bight section thereof. The contact blade matrix is driven in a controlled manner onto the support body so as to insert the leg sections of the matrix through their associated apertures and to sever the linking web portion through its engagement with the shoulder member of the support body. The severed end portions of the blades are then force fitted into their associated recesses.

3,750,092

RANGE SURFACE RECEPTACLE

Allen J. Bury, Prospect Heights, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Nov. 16, 1972, Ser. No. 307,026
Int. Cl. H01r *13/54*
U.S. Cl. 339—192 RL **4 Claims**



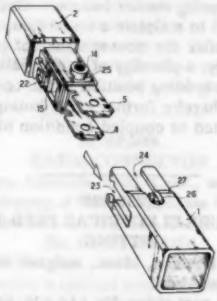
A range unit receptacle is provided having a high temperature molded phenolic body of one piece construction. Spring type terminals are inserted into openings in the body with the terminals already crimped onto lead wires. The front of the body is open to receive the leads from a heating element. A sheet metal mounting clip retains the body in proper mounted position in a range.

3,750,093

MODULAR DEVICE FOR ELECTRICAL CONNECTIONS AND APPLICATIONS THEREOF

Jean Debaigt, Maison-Laffitte, France, assignor to Compagnie Generale D'Entreprises Electriques, Levallois-Perret, France

Continuation of Ser. No. 738,882, June 21, 1968. This application Oct. 19, 1970, Ser. No. 82,192
Claims priority, application France, June 21, 1967, 67111387; Dec. 18, 1967, 67132743
Int. Cl. H01r *13/48*
U.S. Cl. 339—205 **21 Claims**



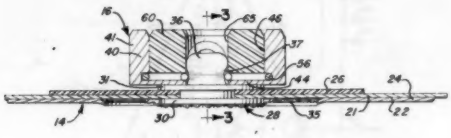
A modular device for forming electrical connections formed of a split, insulated central body with a conductive plate passing therethrough and a pair of complementary bodies each having a conductive strip and adapted to cooperate with the central body to electrically connect the conductive strips.

3,750,094

ELECTRICAL CONNECTOR

Ilias Zenkich, Norridge, Ill., assignor to Zenco Engineering Corporation, Chicago, Ill.

Filed Mar. 9, 1972, Ser. No. 233,075
Int. Cl. H01r 9/08
U.S. Cl. 339—217 R **8 Claims**



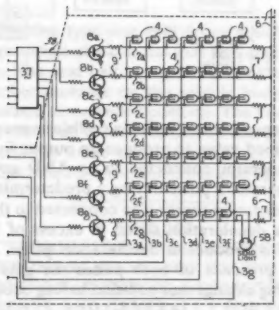
An electrical connector for an electrode assembly having a housing with a central opening therein and integral side and bottom walls so that the bottom wall is in intimate electrical contact with a flange on a releasable electrode, there being provided a recess in the bottom of the housing opening for receiving a C-shaped spring having parallel arm portions that are spaced apart by a diametral projection on a plastic plug that fits within the housing opening. The plug has a central opening which releasably receives a male projection on the electrode and the spring arms grasp a reduced portion of this male projection. The plug is held within the housing primarily by a press fit, and an electrical connector fitting is threadedly received in the housing and has a portion extending into the housing opening and into the plastic plug.

3,750,095

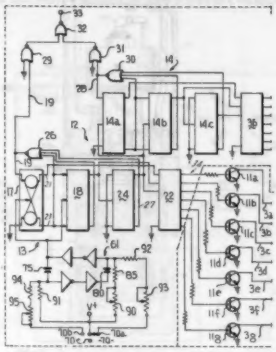
FOREIGN OBJECT LOCATOR

Ole V. Olesen, 7957 Queens Rd., Glen Burnie, Md.

Filed Sept. 15, 1970, Ser. No. 72,456
Int. Cl. G01s 9/68
U.S. Cl. 340—3 C **11 Claims**



The apparatus employs transmission and reflection of sonic impulses in water to detect foreign objects. A matrix sequentially and successively primes, individually and at a prescribed rate, each of a plurality of bulbs commencing with transmission of each pulse. Detection of a reflected pulse energizes the bulbs at the time of reception of such pulse. Since the rate of sequencing of the bulbs is fixed and the rate of transmission of sound in water is a constant, depth is indicated by the bulb illuminated by the reflected pulse. Range switching is accomplished by changing in discrete increments the rate of sequencing of the matrix. A one-shot multivibrator is employed to energize the bulbs to insure uniform illumination in spite of large variations in reflected energy.

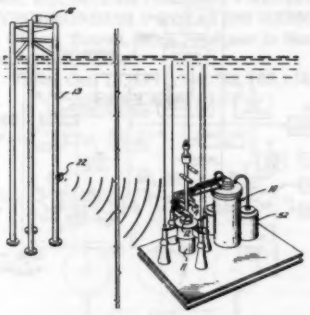


3,750,096

ACOUSTICAL UNDERWATER CONTROL APPARATUS

Paul C. Koomey, Houston, Tex.; George S. Stivers, Baltimore, and Theodore R. Barker, II, Pasadena, both of Md., assignors to Global Marine, Inc., Los Angeles, Calif.

Division of Ser. No. 504,742, Oct. 24, 1965, Pat. No. 3,405,387. This application July 25, 1969, Ser. No. 847,808
Int. Cl. H04b 11/00
U.S. Cl. 340—5 R **5 Claims**



An acoustical control apparatus for controlling the operation of underwater valve equipment from the surface by coded acoustical signals and monitoring the status of the equipment by acoustical signals. A radioisotope thermoelectric generator positioned underwater continuously charging a battery which powers a pump for maintaining hydraulic pressure in an accumulator for actuating an underwater valve, all of which is controlled and monitored about the water surface by the use of coded acoustical signals.

3,750,097

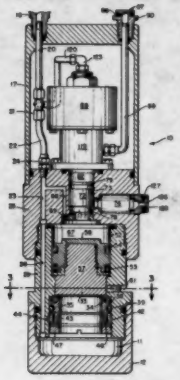
COMPRESSED GAS SEISMIC ENERGY GENERATOR

John J. Havlik, and Billy H. Towell, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 8, 1971, Ser. No. 160,693
Int. Cl. H04b 13/00
U.S. Cl. 340—12 R **14 Claims**

A compressed gas gun for generating a seismic pulse in water. It has a floating-action piston controlled by an auxiliary

piston for releasing a compressed gas charge suddenly. It also



shapes the discharge gas pattern in the water to reduce secondary bubble pulse action.

3,750,098

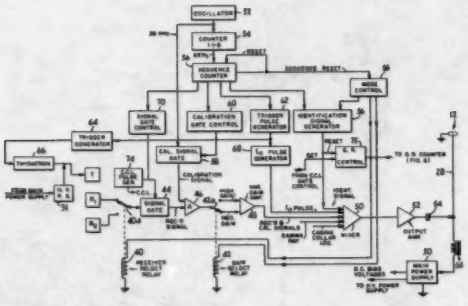
DOWNHOLE ACOUSTIC LOGGING CONTROL SYSTEM

Fred W. Zill, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 710,279, March 4, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,507

Int. Cl. G01v 1/22, 5/00

U.S. Cl. 340—18 CM **45 Claims**



Apparatus for acoustically logging a borehole to obtain indications of the effectiveness of the cement between a casing and a borehole to prevent fluid communication characterized by a downhole digital control system for repetitively energizing an acoustic transmitter and selectively coupling electrical signals developed by the receivers upon receiving transmitted acoustic energy to a signal channel. The signal channel is arranged to provide at least two degrees of amplification of the electrical signals in a sequence synchronized with the transmissions of acoustic energy from the transmitter. In a predetermined order, electrical signals from each receiver corresponding to different acoustic transmissions will be amplified to respective different degrees and coupled to a conductor for transmission to the surface. For the purpose of identifying the receiver and degree of amplification selected, the system provides, at preselected intervals, both an identifying pulse signal and a calibration signal of reference amplitude and frequency. All functions of the downhole system are controlled by a digital sequence counter and associated circuits which automatically select the receiver, the degree of amplification and relative time of occurrence of each signal during each sequence.

3,750,099

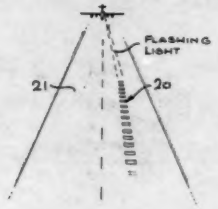
PACING SYSTEM FOR CONVEYANCES

Robert E. Proctor, 11311 Stanwood Dr., Los Angeles, Calif.

Filed Mar. 17, 1972, Ser. No. 235,757

Int. Cl. G08g 1/09, 5/00

U.S. Cl. 340—22 **7 Claims**



Systems for pacing the movement of conveyances are disclosed, each system being comprised of a stationary strip of equally spaced bars, the longitudinal axis of the bars being transverse to the direction of traffic (either erect on one side or horizontal in the path of the traffic, such as on an airport runway) and means for intermittently illuminating them simultaneously at a selected frequency, where the frequency is selected to produce a stroboscopic effect on an observer moving parallel to the strip of such bars, such that only at a predetermined velocity will the bars appear to be motionless, i.e., appear to have a velocity of zero relative to the moving observer.

3,750,100

SYSTEM FOR SENSING COLLISION OF MOTOR VEHICLES

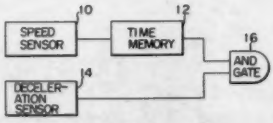
Atsushi Ueda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1972, Ser. No. 233,188

Claims priority, application Japan, Mar. 16, 1971, 46/14584

Int. Cl. B60q 1/52

U.S. Cl. 340—52 H **6 Claims**



A collision speed sensor senses a collision speed in excess of its predetermined value to produce an output for application to a pulse generator connected to an AND gate. Then the generator generates a pulse having a predetermined fixed duration. A deceleration sensor also connected to the AND gate responds to a deceleration signal in excess of its predetermined value to produce a deceleration pulse. Only in the simultaneous presence of both pulses the gate produces a signal indicating a dangerous collision having occurred.

3,750,101

SYSTEM FOR AUTOMATICALLY CHECKING BRAKE REGULATING SYSTEMS

Gosta Holger Granlund, Goteborg, Sweden (SW), assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed July 27, 1971, Ser. No. 166,412

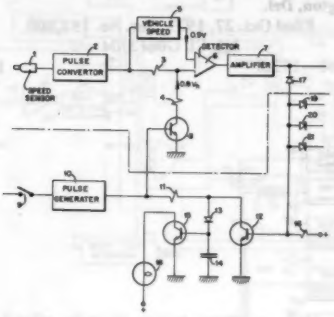
Claims priority, application Sweden, July 27, 1970, 10293/70

Int. Cl. B60t 17/22

U.S. Cl. 340—52 B **6 Claims**

This invention is related to a safety checking device for an electronic braking system used primarily in wheeled vehicles

and which indicates a malfunction of the system before the braking system is applied. The safety device introduces a signal to an electronic unit in the braking system; if there is a



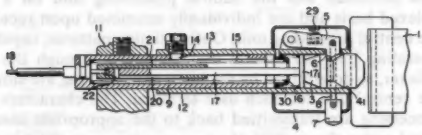
failure thereof, a warning circuit is triggered to give a proper alarm to the vehicle operator. The safety device is also designed so that it does not operate during application of the braking system.

3,750,102

SELF-RETRACTING TYPE SEAT BELT DEVICE FOR VEHICLE USE

Motohiro Okada, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 8, 1972, Ser. No. 260,732
Claims priority, application Japan, June 9, 1971, 46/40799
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E **10 Claims**



A self-retracting type seat belt device which is adapted to keep an appropriate slack in the seat belt applied around the user's body. The seat belt comprises a buckle including one buckle member movable on the vehicle body and normally biased to assume an extended position. The buckle member is temporarily retracted to lock the belt winder under the engaging pressure of the other buckle member secured to the free end of the seat belt when the belt is buckled up.

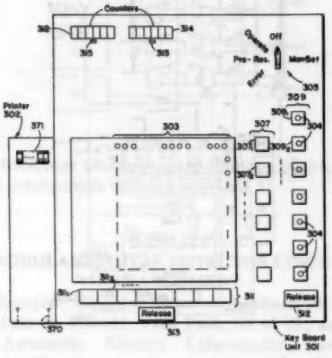
3,750,103

ELECTRONIC SYSTEM EMPLOYING PLURAL PROCESSING STATIONS FOR ISSUING AIRLINE BOARDING PASSES WHILE EFFECTING SEAT ASSIGNMENTS, AND GENERALLY FOR PARCELLING ELEMENTS OF AN ORDERED SET

David R. Angus, Flemington, N.J., and William Reid Smith-Vaniz, Darien, Conn., assignors to General Computing Equipment Corporation, Princeton, N.J.

Filed Dec. 30, 1970, Ser. No. 102,629
Int. Cl. H04q *1/00, 3/00*
U.S. Cl. 340—153 R **21 Claims**

A digital, electronic system for issuing airline boarding passes, while effecting aircraft seat assignments, employs a central processor unit connected via a plurality of system busses to a plurality of parallel connected keyboard units each having a boarding pass enscribing alpha-numeric printer associated therewith. The central processor includes a circulating memory for storing information characterizing the availability of seats for the particular aircraft in service, while the keyboard units include a lamp matrix for displaying seat availability in a section (zone) of the aircraft selected by a passenger.



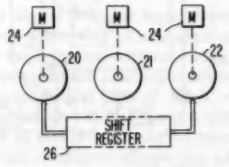
The central processor sequentially and cyclically polls all on line keyboard units, accommodating all proper seat requests while maintaining real time supervision over the memory contents and the keyboard units. Seat assignments are automatically printed, together with other pertinent information, on a boarding pass when a seat is selected.

3,750,104

METHOD AND APPARATUS FOR SYNCHRONIZING A DYNAMIC RECIRCULATING SHIFT REGISTER WITH ASYNCHRONOUSLY ROTATING MEMORIES

Hoy Ying Chang, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,110
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 **4 Claims**



A computing system having a plurality of asynchronously rotating memories is described herein. A dynamic recirculating shift register is synchronized with a first memory for receiving information therefrom. After the recirculating shift register has the information stored therein, it is bit position synchronized with the second memory for transfer of information thereto. The algorithm and the method of synchronizing the shift register with the second memory is described herein.

3,750,105

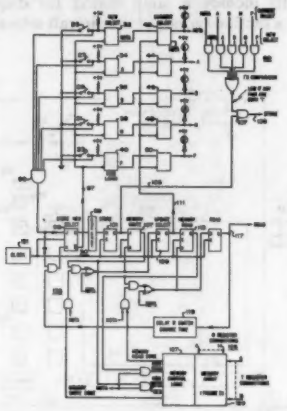
DATA ENTRY AND DISPLAY APPARATUS

Michael B. Raynham, San Jose, Calif., assignor to Hewlitt-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1972, Ser. No. 226,251
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **3 Claims**

A display register and two-bit shift registers for each of a plurality of register-selecting switches are provided in addition

to conventional storage registers in a computer for temporari-



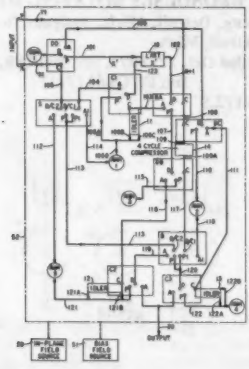
ly displaying and manipulating data thus displayed prior to its transfer into a selected register.

3,750,106

VARIABLE FUNCTION MAGNETIC DOMAIN ARRANGEMENT

Lionel Caron, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 2, 1971, Ser. No. 168,166
Int. Cl. G06f *1/00*; G11c *5/02*
U.S. Cl. 340—172.5 **27 Claims**



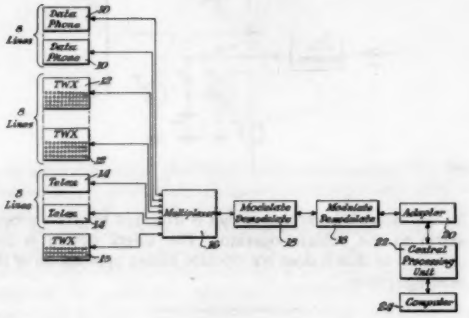
A magnetic domain variable function arrangement is realized by a magnetically soft overlay geometry which controls the movement of single wall domains in a slice of magnetic material in response to a reorienting magnetic field. The overlay geometry defines first and second input channels, an output channel and control channels connecting the input channels in synchronous relationship with each other and with the output channel such that coordinated domains propagated along the input channels in a first specifically timed relationship cause subsequently propagated input domains to provide output domains on the output channel only when the input domains are in an AND relationship with each other. The overlay geometry is arranged to provide output domains corresponding to an EXCLUSIVE OR relationship between input domains after a second timed relationship between input domains is detected. Other functions are also provided under control of other timed relationships.

3,750,107

METHOD AND SYSTEM FOR PROCESSING CHARACTERS ON A REAL TIME BASIS

John M. Pyne, West Chester, Pa., assignor to Sci-Tek, Inc., Wilmington, Del.

Filed Oct. 27, 1971, Ser. No. 192,800
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **11 Claims**



There is described herein a real time method and system for transferring characters between several user terminals, operating at different character transfer speeds, and a central processing unit. The characters are transmitted between the user terminals and the central processing unit on a multiplexed basis and are individually examined upon receipt at the central processing unit. Output timing patterns, capable of operating into the several user terminals through the multiplexer, as determined by the input examination, are stored in the central unit for each user terminal. The characters after processing are transmitted back to the appropriate user terminal under the control of an appropriate output timing pattern which synchronizes the transmission with the user terminal operating speed. This output timing pattern is held in a shift register and shifted out bit by bit to control the transmission or non-transmission of a character. If no transmission is indicated an idle character is sent. Upon completion of the shifting process for the desired number of characters, the residue remaining in the shift register is examined and utilized to control what new timing pattern is reintroduced into the shift register for transmission of the next character to that particular user terminal. A counter is decremented with the transmission of each character to control the number of shift pulses applied to the shift register.

3,750,108

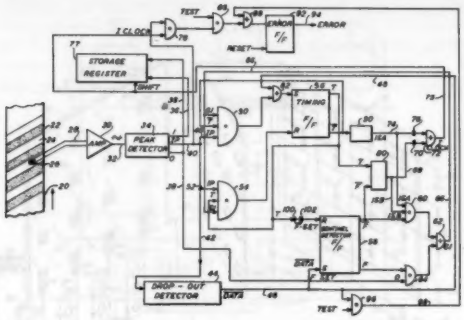
SELF-CLOCKING RECORD SENSING SYSTEM

Alan K. Jensen, Livingston, N.J., assignor to Litton Business Systems, Inc., Morristown, N.J.

Continuation of Ser. No. 857,603, Sept. 12, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,044
Int. Cl. G06f *1/04*; G11b *27/24*
U.S. Cl. 340—172.5 **10 Claims**

The system comprises a pair of timing circuits which, through logic circuitry, are alternately charged by incoming signals derived from a peak detector. The output signals of the timing circuits are so spaced as to provide a period of time within which a signal of a variable frequency signal train may

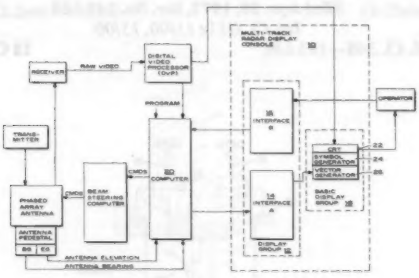
be sampled. The circuitry is provided in order to enable the system to go from a quiescent condition to an operating condition and finally, when no proper signals are received within a predetermined time, return to the quiescent condition.



3,750,109
MULTITRACK RADAR DISPLAY CONSOLE

Richard Miles Smith, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Sept. 13, 1971, Ser. No. 179,881
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **5 Claims**



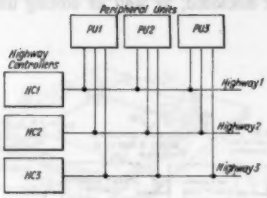
A multitrack radar display console having first and second interfaces for coupling a UNIVAC 1218 or 1219 computer to the ITT Basic Display Group. The first interface accepts the 18 bit computer words, assembles and stores them in the 36 bit word format required by the BDG and, on command, transfers the 36 bit words to the BDG. The second interface permits operator originated communication with the computer.

3,750,110
DATA TRANSFER SYSTEMS

John Terry Martin, Crowthorne; John Elstow Remmington, Workingham, and John Bedford, Reading, all of England, assignors to Ferranti Limited, Hollinwood, Lancashire, England

Filed Nov. 24, 1971, Ser. No. 201,745
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **19 Claims**

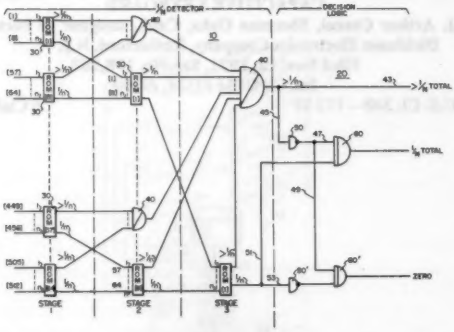
A data transfer system has a plurality of peripheral units each of which may be required to receive data from, or transmit data to, another such unit. Each peripheral unit is connected to each of at least two data highways, and each highway is provided with its own highway controller, which operates to send a sequence of control instructions over the highway. Means are provided at each peripheral unit for checking the received control instructions against one another, and for acting upon the selected instruction. Data source peripheral units are arranged to send the selected instruction back over the highways to maintain the highway controllers in synchronism with one another.



3,750,111
MODULAR DIGITAL DETECTOR CIRCUIT ARRANGEMENT

Alex W. Kobylar, Chicago; Robert L. Lindsay, Mt. Prospect, and Satyan G. Pitroda, Villa Park, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 23, 1972, Ser. No. 283,118
Int. Cl. G06f *7/02*; G11c *17/00*
U.S. Cl. 340—172.5 **7 Claims**



A multi-stage digital detector logic circuit arrangement is provided utilizing a plurality of cascaded read-only memory ROM arrays of the transistor-transistor logic configuration to detect *m* addresses out of *N* total input information addresses, where *m* is a quantity less than *N*. Each read-only memory array has *n* input addresses where *n* is a quantity less than N but greater than *m*, and provides digital output addresses corresponding to logic conditions of zero true addresses, less than *m* true addresses, exactly *m* true addresses, and greater than *m* true addresses. The greater than *m* true addresses are processed by OR logic gates to a final result and the other logic conditions are processed through cascaded ROM arrays until a final ROM array provides a final logic result of zero true addresses out of *N* addresses, *m* true addresses out of *N* addresses, and NOT *m* out of *N* total addresses.

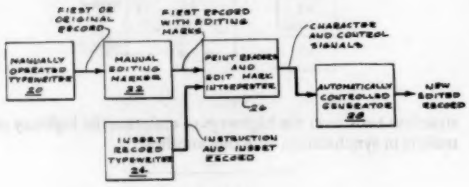
3,750,112
METHOD AND APPARATUS OF EDITING USING COLORED EDITING MARKS

Ron Manly, 1922 W. El Segunda Blvd., Gardena, Calif.

Division of Ser. No. 63,020, Aug. 11, 1970, Pat. No. 3,676,856, which is a continuation of Ser. No. 275,415, April 24, 1963. This application May 1, 1972, Ser. No. 249,354
Int. Cl. G06f *11/00*; B41j *5/30*
U.S. Cl. 340—172.5 **20 Claims**

Methods and systems to avoid manually retyping or rekeyboarding textual material when revising or correcting the

information contained in a record either while originally preparing the information or at a later date. The use of print readers or character recognition devices to accomplish this "editing" is disclosed, as well as editing using paper tape


FIRST OR ORIGINAL RECORD
FIRST RECORD WITH EDITING MARKS
CHARACTER AND CONTROL SIGNALS
MANUALLY OPERATED TYPEWRITER 22
MAUAL EDITING MARKER 23
PRINT READER AND EDIT MARK INTERPRETER
AUTOMATICALLY CONTROLLED GENERATOR 25
NEW EDITED RECORD
ISSUE RECORD TYPEWRITER 24
INSTRUCTION AND ISSUE RECORD

typewriters, display devices, and other means such as using editing instructions. Methods are also disclosed for automatically reformatting the information into lines after insertions, deletions, or other changes requiring shifting of the line layout of the information.

3,750,113

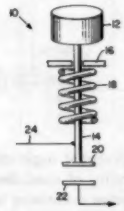
CAPACITIVE KEYBOARD

J. Arthur Cencel, Sherman Oaks, Calif., assignor to Becton, Dickinson Electronics Company, Rutherford, N.J.

Filed Nov. 12, 1971, Ser. No. 198,268

Int. Cl. G11c *11/24, 17/00*

U.S. Cl. 340—173 SP **5 Claims**



A n-key capacitive keyboard is coupled to an n-bit shift register. Each key is sequentially "interrogated" and, if actuated, an output pulse appears which is applied to the input of the shift register. The output pulse is also compared to the output of the shift register, corresponding to the "state" of the key in the prior cycle. An output pulse is generated on the first occurrence of a signal representing actuation of the key. The output of the shift register is also applied to make the key circuit more sensitive and therefore require less key travel to pass the interrogating pulse.

3,750,114

CHARGE COUPLED ELECTRONIC LINE SCANNER

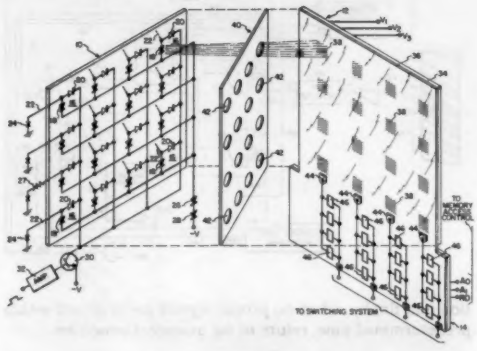
John G. Valassis, Elmwood Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 10, 1972, Ser. No. 233,644

Int. Cl. G11c *7/00, 11/42, 11/50*

U.S. Cl. 340—173 LS **12 Claims**

There is herein disclosed an electronic line scanner wherein a light emitting diode array is used to monitor the status of the supervised lines. The diode array is disposed adjacent a charge coupled semiconductor device which is operated in a shift register mode to write the binary line status information into a random access memory.



3,750,115

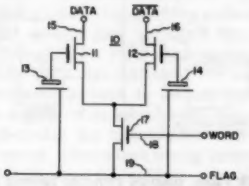
READ MOSTLY ASSOCIATIVE MEMORY CELL FOR UNIVERSAL LOGIC

Joseph L. Mundy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,668

Int. Cl. G11c *15/00, 15/00*

U.S. Cl. 340—173 AM **18 Claims**



A universal logic system is disclosed wherein arbitrary Boolean functions can be generated by cascading AND and OR logic. The logic system comprises an array of read mostly associative memory cells for storing information determinative of the logic produced. Information is stored in the form of charge, avalanche injected into the gate electrode of floating gate field effect transistors. The AND and OR functions are performed by associative search and read operations respectively. Erasure is performed by avalanche injection from the floating gate to the substrate of the transistor. Voltage variable capacitance elements are included to selectively enhance voltages within the cell.

3,750,116

HALF GOOD CHIP WITH LOW POWER DISSIPATION

Douglas Wayne Kemerer, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

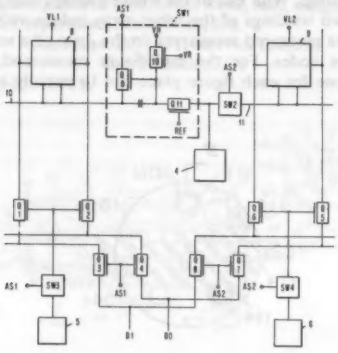
Filed June 30, 1972, Ser. No. 267,827

Int. Cl. G11c *11/34*

U.S. Cl. 340—173 BB **2 Claims**

A memory array chip constructed from field effect transistors (FET) which is particularly suitable for use in systems wherein only a portion of the total memory capacity

of a chip is used. The chip contains two or more separate memory arrays, each substantially isolated from the others. If

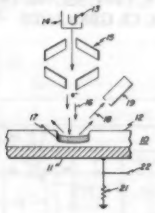


one of the arrays is not to be utilized, power may be removed therefrom.

3,750,117
ELECTRON BEAM ADDRESSABLE ARCHIVAL MEMORY

Arthur C. M. Chen, and Jish-Min Wang, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,125
Int. Cl. G11c *11/42*
U.S. Cl. 340—173 LS **10 Claims**



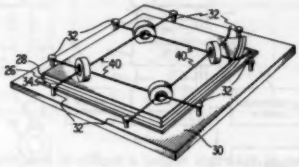
An electron beam addressable memory is disclosed wherein information is stored as deformation and phase changes in a non-crystalline thin film. The thin film comprises a material having metastable structural characteristics. Information is stored by locally heating the film to change it from one state to another, thereby deforming it. Readout is accomplished by scanning the film with an electron beam and determining the stored information by variations in secondary electron emission yield due to the deformations and phase changes in the film.

3,750,118
MAGNETIC CORE MEMORY PLANE CONSTRUCTION

Thomas Philip Fulton, Norfolk, Mass., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 825,298, May 16, 1969, Pat. No. 3,594,897. This application Jan. 15, 1971, Ser. No. 106,913
Int. Cl. G11c *5/04*, *11/06*
U.S. Cl. 340—174 MA **1 Claim**

A ferrite magnetic core memory plane construction, and method of construction, in which the edges of the magnetic cores, after being primed, are imbedded in a tenacious material coated on a flexible supporting sheet, the material being a silicone rubber having a jelly-like resilience. The edges of the cores are imbedded an amount equal to about one-half the dimension radially between the inner and outer surfaces of the cores so that the holes in the cores are fully exposed for wires to be threaded therethrough. The cores tend to spring back to their set positions after being displaced in any direction during

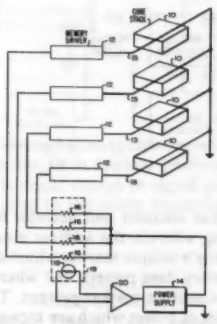


the assembly of a memory plane. The completed memory plane includes the flexible sheet and rubber-adhered cores as an integral part of the construction to protect the cores from mechanical shock, thermal changes, etc.

3,750,119
COMPUTER MEMORY TEMPERATURE COMPENSATION

Robert J. Frankenberg, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 20, 1971, Ser. No. 191,086
Int. Cl. G11c *7/04*
U.S. Cl. 340—174 SC **2 Claims**



In a computer having a plurality of memory units, a series resistor is connected between the memory power supply and each memory unit. A temperature sensor is located near the series resistors such that it senses the average of the temperature of those resistors and such that, in the absence of current flowing through the series resistors, the sensor senses the ambient temperature of the computer. A control circuit for the power supply is connected to the sensor to effect temperature compensation of the power supply drive to the memory units.

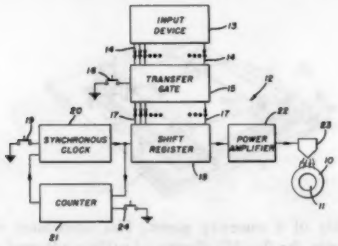
3,750,120
METHOD AND APPARATUS FOR RECORDING INFORMATION ON AND RETRIEVING INFORMATION FROM A PNEUMATIC TIRE

John R. McCarty, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 7, 1971, Ser. No. 189,470
Int. Cl. G11b *5/74*
U.S. Cl. 340—174.1 K **6 Claims**

A tire or a portion thereof is compounded with a magnetizable material mixed in with the conventional rubber stock. At any point during the manufacturing porcess, such as the building of the tire, a digital code is magnetically printed on the magnetic rubber by a magnetic printing head which is

preferably electronically controlled but which could utilize permanent magnets. Thereafter the tire is vulcanized and eventually ready for public use with the magnetic information



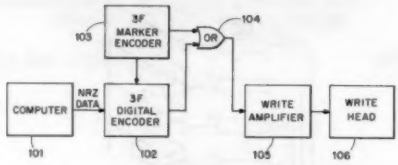
remaining therein. An electonically controlled magnetic reading device can be utilized to read out the recorded information at any desired time.

3,750,121

ADDRESS MARKER ENCODER IN THREE FREQUENCY RECORDING

Dae-Woo Lee, North Billerica, Mass., assignor to Honeywell Information Systems Inc., Walthom, Mass.

Filed June 18, 1971, Ser. No. 154,519
Int. Cl. G11b *5/00*
U.S. Cl. 340—174.1 G **5 Claims**



An address marker encoder and decoder for use in three frequency recording wherein the address marker encoder is capable of generating a unique marker which does not appear in any three frequency data pattern and wherein the marker decoder detects the written marker pattern. The marker pattern of bits is a series of pulses which are repeated in a pattern of 1.5T followed by 2T where T is defined as a data rate period. The second stage of a seven bit binary down counter having a clock rate of 2N pulses per second (where N is the data rate) provides the desired marker pulses. The marker decoder detects the bit marker pattern by providing a stage of 1.5T detector, another of 2T detector and three stages of a binary counter. The first two stages of the detector detect one occurrence of 1.5T followed by 2T. Any consecutive even number of 1.5T pulses are rejected at the first stage of detector. Any T pulses reset the entire decoder. Any 2T pulses reset the first stage detector whereas any 1.5T pulses reset the second stage of the detector. The number of detected pulses are counted by the binary counter to set the OK READ DATA signal.

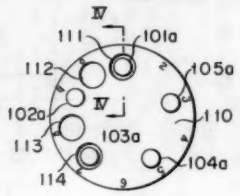
3,750,122

INDUCTION TYPE TELEMETERING SYSTEM

Yoshio Maeda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1972, Ser. No. 243,602
Claims priority, application Japan, Apr. 19, 1971, 46/25132
Int. Cl. G08c *19/16*
U.S. Cl. 340—196 **17 Claims**

An encoding device includes two circular arrays of five equally spaced windings disposed in opposite relationships to sandwich a rotatable metallic disc provided with four openings. The openings are arranged such that, as the disc is rotated according to the measured decimal measurand, any two of them are always put between selected two pairs of opposite windings. With one of the winding arrays energized the selected two windings of the other array induce voltages indicating the measured measurand in the form of a set of two out of five codes. For the multifigure measurand, output windings one for each figure place can be serially interconnected while driving windings five for each place are sequentially energized through respective switching transistor to serially produce corresponding two-out-of-five codes from the output windings. Alternatively driving windings one for each place may be serially interconnected and successively energized through respective switching transistors while sets of corresponding output windings for all places are scanned for each place through individual transistors one for each set.

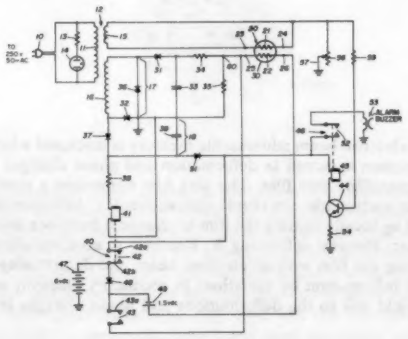


3,750,123

SMOKE SENSING CIRCUIT WITH BATTERY STANDBY

Louis A. Caillouet, Jr., Irving, Tex., assignor to T. J. Connelly Construction Company, Inc., Dallas, Tex.

Filed Nov. 1, 1971, Ser. No. 194,679
Int. Cl. G08b *21/00*
U.S. Cl. 340—237 R **3 Claims**

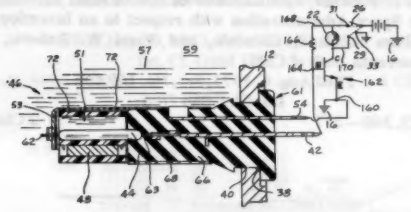


A fire and gas alarm system utilizing a four-terminal sensing device positioned in the environmental region to be monitored. The sensing device includes a pair of resistance heating wires spaced apart by a conducting core and encompassed by an outer metallic shell. A transformer powers a pair of rectifiers which supply current to both a normally operated standby relay and the four-terminal smoke and gas sensing device. When hydrocarbon vapors or smoke impinges upon the metallic shell of the sensing device, the resistance between the pair of heater wires drops to operate a relay and produce an alarm indication. Upon failure of a.c. power, the standby relay is released to connect battery power to the circuit and insure continued operation in response to an alarm condition.

3,750,124
FLUID LEVEL SWITCH

Charles M. barnes; Raymond Kosaeski, Jr., both of St. Joseph, Mich., and James B. Putt, South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Sept. 20, 1971, Ser. No. 181,699
Int. Cl. B60t *17/22*
U.S. Cl. 340—244 E **6 Claims**

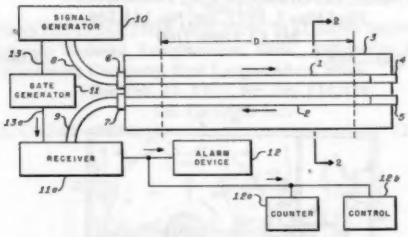


An indicator for warning of low fluid level in a master cylinder reservoir having an electrical reed switch mounted horizontally in the wall of a fluid reservoir and connected to appropriate indicator circuitry for warning the vehicle operator of the low fluid condition. The reed switch is actuated by a permanent magnet encapsulated in a float whenever the fluid level becomes dangerously low.

3,750,125
TRANSMISSION LINE PRESENCE SENSOR

Gerald F. Ross, Lexington, and David Lamensdorf, both of Cambridge, Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 20, 1971, Ser. No. 190,842
Int. Cl. G08b *13/26*
U.S. Cl. 340—258 C **18 Claims**



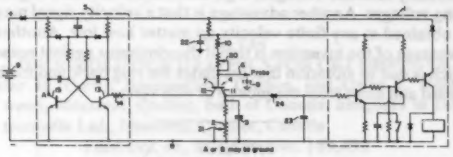
A pulse generator-receiver system for detecting the presence or proximity of objects including persons employs transmission of short base-band or subnanosecond electromagnetic pulsed signals and reception thereof within a dispersionless, broad band transmission line energy coupling system with a receiver circuit cooperating with a biased semiconductor device located within the transmission line coupling system for instantaneously detecting substantially the total energy of each coupled base-band pulse and for providing corresponding outputs suitable for indication of the presence of such proximate objects.

3,750,126
PROXIMITY DETECTOR

Elias E. Solomon, Duxbury, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Continuation of Ser. No. 18,654, March 11, 1970, abandoned. This application Feb. 3, 1972, Ser. No. 223,074
Int. Cl. G08b *13/26*
U.S. Cl. 340—258 C **7 Claims**

The increase in capacitance with decrease in distance between an object and an approaching person or vehicle is used as part of the input signal to a capacitance multiplying device, the output of which provides a signal to a detection or alarm circuit. The small increase in capacitance in the input

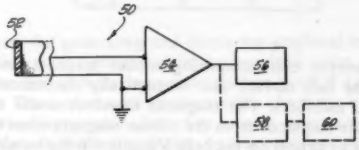


circuit provides in effect a larger increase in capacitance in a portion of the output circuit, which causes a reduction in voltage applied to the detection device.

3,750,127
METHOD AND MEANS FOR SENSING STRAIN WITH A PIEZOELECTRIC STRAIN SENSING ELEMENT

Weston D. Ayers, West Covina, and Joseph G. Hirsch, Diamond Bar, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Oct. 28, 1971, Ser. No. 193,419
Int. Cl. G08b *13/02*
U.S. Cl. 340—261 **12 Claims**

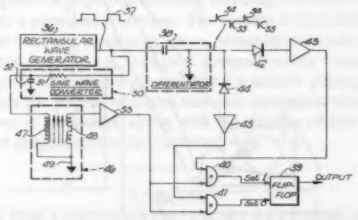


A piezoelectric strain sensing element is used in strain gage, in intrusion detector, or in thermal gradient detector systems to provide an electrical charge or signal proportional in amplitude and polarity to the strain transmitted to the sensing element.

3,750,128
PULSE GENERATOR

Said Sapir, Westlake Village, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 7, 1972, Ser. No. 223,879
Int. Cl. G01p *3/48*
U.S. Cl. 340—263 **24 Claims**



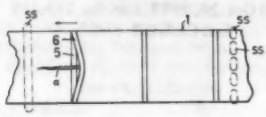
An electromagnetic pulse generator for use in anti-skid braking systems and in many other applications. A toothed magnetic ring rotates with the wheel of a motor vehicle. A fixed magnetic pickup forms a variable reluctance transformer with the ring. The transformer primary winding is energized with a converted rectangular wave. A differentiator is connected from the rectangular wave generator to a pair of synchronous detectors which receive a common input from the transformer secondary winding. The synchronous detector

outputs are impressed on respective flip-flop inputs. The flip-flop output is then a pulse train which is representative of both the position and the velocity of the wheel. One advantage of the pulse generator is that it discriminates against the noise of externally induced voltages, e.g., internal combustion engine firing voltages. Another advantage is that a velocity signal may be obtained at any finite velocity no matter how low. Another advantage of the invention is that it discriminates against noise which is due to vibration that oscillates the ring back and forth toward and away from the pickup or vice versa.

3,750,129
CONVEYOR BELT APPARATUS

Keigo Takeno, and Sichiro Watanabe, both of c/o Tadashi Wakabayoshi Kowa Bldg., No. 10, No. 7-7, 1-chome, Minato-ku, Tokyo, Japan

Filed Sept. 1, 1971, Ser. No. 176,937
Claims priority, application Japan, Sept. 7, 1970, 45/78379; July 3, 1971, 46/48988; Feb. 27, 1971, 46/12133 (utility model); May 24, 1971, 46/42119 (utility model)
Int. Cl. B65g *43/02*; G08b *21/00*
U.S. Cl. 340—267 R **14 Claims**

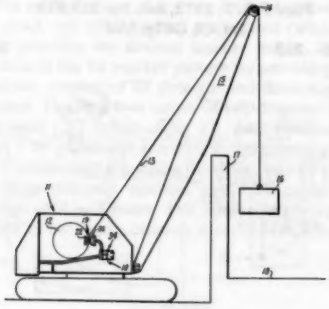


A conveyor belt comprising rubber magnets embedded below the belt surface and magnetically shortcircuited by magnetic members. The magnetic members under the belt surface are displaced from the rubber magnets when longitudinal cracks appear on the belt. Variation in the outside magnetic field of the rubber magnet due to displacement of the magnetic bodies are detected by detectors which indicate the appearance of longitudinal cracks.

3,750,130
ELECTRICAL INDICATOR

Lawrence R. Lute, 2511 E. 29th St., Lorain, Ohio

Filed Nov. 17, 1971, Ser. No. 199,696
Int. Cl. G08b *7/06*
U.S. Cl. 340—267 C **3 Claims**

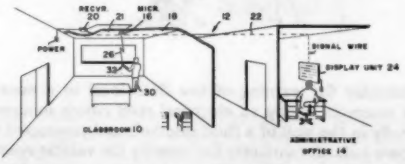


An electrical indicator for indicating increments of cable wound or unwound from a hoisting drum. A cam operated switch is associated with the hoisting drums so that the switch is closed once each revolution of the cam. The switch is wired into a circuit so as to ring a bell each time it is closed with the bell being wired into a circuit to cause the light to light and an electrical vibrator to vibrate each time the bell rings so that the operator of the equipment has a visual indication, an audible indication, and an indication for the sense of touch. A plurality of switches are provided which can be switched into the circuit so that a plurality of indications are given on each rotation of the cam.

3,750,131
SILENT EMERGENCY ALARM SYSTEM FOR SCHOOLS AND THE LIKE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; William S. Read, Glendale, and Vasel W. Roberts, La Cresecenta, both of Calif.

Filed Aug. 6, 1971, Ser. No. 169,671
Int. Cl. G08b *7/06*
U.S. Cl. 340—277 **2 Claims**

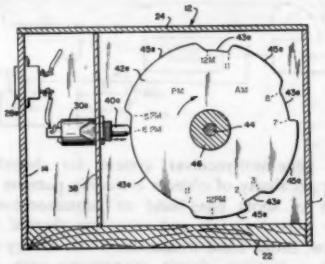


In a school each classroom (or other area) is instrumented with a hidden microphone and receiver tuned to a non-audible frequency. The receivers' outputs are connected to a central display unit in the school's administrative office. Each instructor is provided with a small concealable transmitter which, when hand activated by the instructor upon the occurrence of any emergency, generates a non-audible signal at the receiver's tuned frequency.

3,750,132
BURGLARY DETERRENT SYSTEM

Howard Natter, 185 Grandview Ave., Yonkers, N.Y.

Filed May 7, 1971, Ser. No. 141,246
Int. Cl. G08b *1/00*
U.S. Cl. 340—309.1 **7 Claims**



A household burglary deterrent system employs a motor driving a plurality of cams for controlling a plurality of electrical receptacles in accordance with a predetermined program. Each of the receptacles feeds a different occupancy simulation device positioned within a vacant dwelling. Each cam is so programmed as to activate its associated occupancy simulation device at such time intervals and for multiple time durations within a 24 hour period to produce the illusion of continued dwelling occupancy. The electrical supply to each receptacle is controlled by a switch which is activated by a cam. The occupancy simulation devices are selected for ready sensorial perception and present, to the would be prowler, the facade of continued habitation. Included among the simulation devices are conventional visually perceptible devices, e.g., lamps, television receivers, etc., audibly perceptible devices, e.g., radios, television audio receivers, tape players,

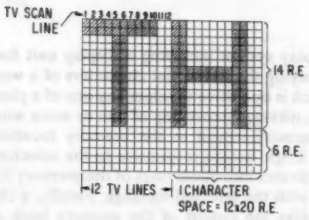
etc. Additionally included are devices designed to produce the illusion of inhabitants moving about by casting moving shadows visible through windows.

3,750,133

HOME TELEVISION RECEIVER MODIFIED TO OPERATE AS VIDEO TERMINAL

Walter Allen Helbig, Sr., Medford Lakes, N.J., and Walter Lee Ross, Simi, Calif., assignors to RCA Corporation, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,636
Int. Cl. G06f 3/14
U.S. Cl. 340—324 AD **8 Claims**



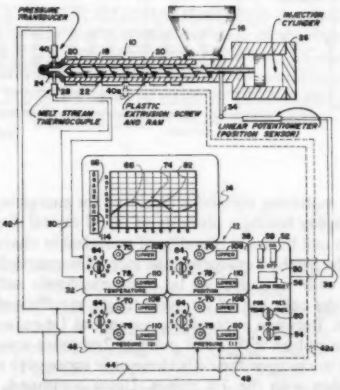
A video terminal includes the deflection, power supply, video, and synchronization circuits of a commercial, home television receiver. The deflection yoke of the receiver is rotated through 90° to provide fast vertical rather than fast horizontal sweeps. The fast sweep frequency is approximately doubled to improve resolution along the rows of the characters displayed. The bandwidth of the receiver is increased to improve resolution in the fast sweep direction. The fast sweep retrace period, the slow sweep retrace period, and the frame repetition period of the receiver are not changed.

3,750,134

PLASTIC INJECTION MOLDING MACHINE MONITOR

Burke A. Weisend, Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Feb. 11, 1971, Ser. No. 114,426
Int. Cl. G08b 5/22
U.S. Cl. 340—324 A **12 Claims**



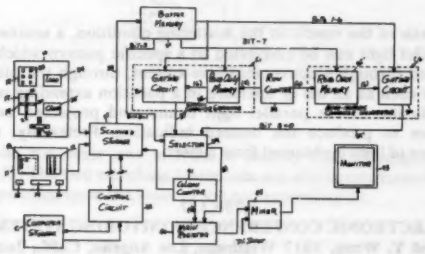
A monitoring system for a plastic injection molding machine adapted to measure the temperature and pressure of the material being plasticized and injected and to determine the position of the machine ram at any selected point in time in the machine cycle. The system employs sensors for the aforesaid measurements and determinations which are connected in electrical circuitry adapted to compare the sensed information with selected and adjustable upper and lower limits and to provide an alarm signal when the limits are crossed. An oscilloscopic display unit is employed to provide a visual comparison of sensed machine information with the said limits when desired.

3,750,135

LOW RESOLUTION GRAPHICS FOR CRT DISPLAYS

Peter M. Carey, Beaconsfield, Quebec, and Owen L. Holmwood, Montreal, Quebec, both of Canada, assignors to Lektromedia Ltd., Montreal, Quebec, Canada

Filed Oct. 15, 1971, Ser. No. 189,496
Int. Cl. G06f 3/14
U.S. Cl. 340—324 AD **29 Claims**



A system for generating and displaying graphical information for interactive computer display terminals using graphic display mediums employing a raster pattern, such as a cathode ray tube. The system uses programmable character elements for constructing graphic characters in such manner that they are highly adaptable for display by conventional television monitors. Each graphic character is constructed by the character elements in an individual cell pattern and a plurality of these adjacently located cell patterns render a continuous graphic diagram. All of the cells which make up the graphic diagram are of the same size and typically eight dots by twelve dots and a plurality of graphic element or font types may be used in these cells to generate the various graphic characters. One form of traphic element cell pattern generates the graphic characters in individual cells by means of a plural-point pattern and preferably a six-point pattern and in another form the graphic elements generates the graphic character by means of a plural-bar pattern and preferably a four-bar pattern. The system includes a mimic style keyboard along with cursor controls which are used to create the continuous graphic diagram. An eight bit word representing each character is loaded into a buffer or scanned storage and after a complete diagram has been composed a page representing this diagram may then be loaded into a permanent storage. The system is operable in an origination mode, a storage mode, a presentation mode and a modification mode. A unique programmable read-only memory and associated logic including a unique gating structure permits the display of alpha-numeric data generated at an alpha-numeric keyboard, along with the display of the above mentioned graphic character patterns.

3,750,136

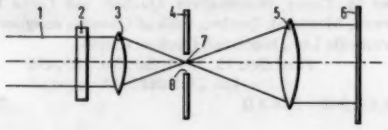
SYSTEM FOR CONTROLLING LIGHT PATTERNS WITH A HIGH CONTRAST

Dieter Roess, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 22, 1971, Ser. No. 117,327
Claims priority, application Germany, Apr. 13, 1970, P 20 17 615.2
Int. Cl. G09f 9/30
U.S. Cl. 340—324 R **5 Claims**

A system to produce a visual presentation on a screen such as alpha-numeric indications characterized by a switching ele-

ment which is a matrix of individually controlled liquid crystals, a converging lens system, a plane filter located at the focal point of the lens system, and a screen. The matrix of liquid crystals includes means to render discrete liquid crystals in a condition to diffuse and scatter the light beams being projected therethrough. By selectively rendering specific liquid



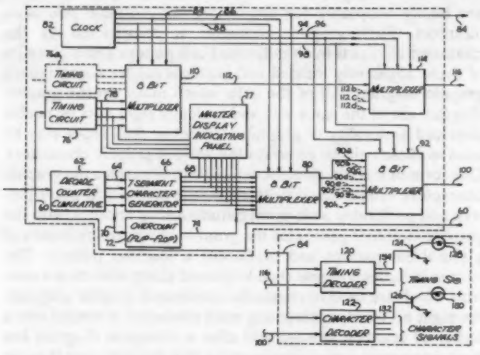
crystals of the matrix in the scattering condition, a source of parallel light can be converted to a specific pattern which is passed through a convergent lens system, through the plane filter such as an iris or aperture in a partition extending perpendicular to the parallel light beams and projected on a screen to produce the desired indication. Preferably, the source of light is obtained from a laser.

3,750,137

ELECTRONIC CONFERENCE MONITORING SYSTEM

Alfred Y. Wong, 1017 Westholm, Los Angeles, Calif.; James M. Nuding, 20415 Baltar St., Canoga Park, Calif., and Zalton J. Lucky, 1287 Indianapolis, Los Angeles, Calif.

Filed Sept. 2, 1971, Ser. No. 177,387
Int. Cl. G08b 5/00
U.S. Cl. 340—330 **11 Claims**



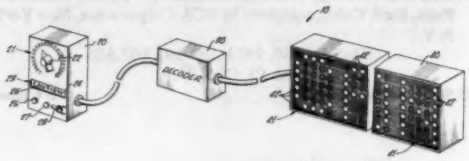
An electronic meeting monitoring system for monitoring and displaying information regarding the progress of meetings in a number of meeting rooms. The system is comprised of a slave unit for each conference room and a master unit for placement in a central area such as a lobby. Each slave unit and the master unit is adapted to identify the conference going on in each conference room by conference number and to indicate the approximate length of time each of the conferences has been in session. When a new conference starts in any of the conference rooms, the speaker pushes a button which advances the numeral indicating the conference number currently in session in that room by one digit and, further, resets the time indication for that room, on the master unit and all slave units. The signals transmitted between the master unit and the slave units are generally multiplexed and periodically updated to minimize the cabling between units and to minimize the effects of electrical transients introduced in the system. A color coding system is used to identify the various conference rooms by predetermined color for ease of association of data with the corresponding room.

3,750,138

VISUAL DISPLAY SYSTEM

Paul G. Burgan, Anaheim, and Richard J. Jekiel, Orange, both of Calif., assignors to Richard G. Wentworth, Orange, Calif.

Filed Dec. 17, 1971, Ser. No. 209,046
Int. Cl. G08b 5/36
U.S. Cl. 340—334 **9 Claims**



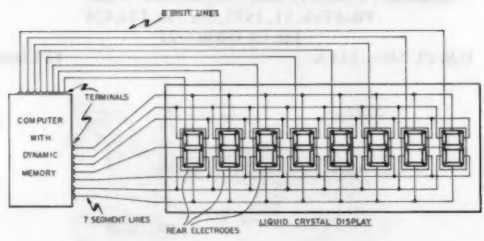
A visual display system including a display unit for simultaneously displaying the individual characters of a word unit. A selector switch is operative to select any one of a plurality of messages, each message consisting of one or more word units which are separately stored in the memory locations of a memory bank. Logic means responsive to the selector switch sequentially activates individual ones of the memory locations in accordance with the selected message. Finally, a character generator receives the output of the memory bank and activates the display unit, a character at a time, until the entire word unit appears, whereupon the memory bank signals the logic means to activate the next memory location in accordance with the selected message.

3,750,139

TIME MATRIXING METHOD OF ENERGIZING SELECTIVE SEGMENTS OF MULTI-CELL LIQUID CRYSTAL DISPLAYS

Theodore L. Blishak, Menlo Park, Calif., assignor to SCM Corporation, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,392
Int. Cl. G08b 5/36
U.S. Cl. 340—336 **12 Claims**



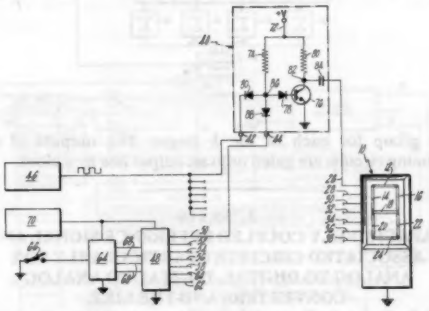
A time matrixing method is disclosed for energizing a liquid crystal display having a plurality of liquid crystal display cells with each cell having a plurality of energizable character segments. The method comprises the step of sequentially pulsing the cells with 1st pulses of 1st pulse amplitude sufficient to energize the cells but of 1st pulse length insufficient to energize them. Between each of the sequential 1st pulses each of the cells is pulsed with a 2nd pulse of 2nd pulse waveform insufficient to energize the cells alone or in successive waveform combination with the 1st pulses. Upon command, selective segments are pulsed in time succession with selected 1st pulses applied thereto with 3rd pulses of 3rd pulse amplitude sufficient to energize the selected cell segments and of 3rd pulse length insufficient alone to energize the selected cell segments and insufficient to energize the selected cell segments in successive pulse length combination with the 2nd pulses but sufficient to energize the selected cell segments to a light scattering mode when the 3rd pulses are applied in successive pulse

length combination with the selected 1st pulses. Thereafter, application of the 2nd pulses is effective to maintain the selected cell segments in their light scattering mode.

3,750,140
OPTICAL DISPLAY DEVICE AND DRIVE CIRCUIT THEREFOR

Paul E. Gray, Winchester, Mass., assignor to Veeder Industries Inc., Hartford, Conn.

Filed May 13, 1971, Ser. No. 142,916
Int. Cl. G08b *5/36*
U.S. Cl. 340—336 **4 Claims**



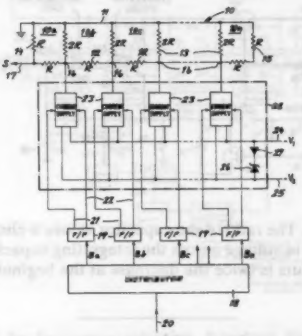
A liquid crystal indicator has a drive circuit wherein a DC drive voltage is converted to an AC signal for the indicator. The drive circuit includes a capacitor connected in series with the DC drive voltage and the liquid crystal indicator and a transistor paralleled with the capacitor. The bias circuit for the transistor includes a resistor and a diode connected in series and an oscillator is connected to the junction between the resistor and the diode of the bias circuit by a second diode which is poled to bleed bias current from the transistor upon negative excursions of the oscillations to turn the transistor off and on. A third diode connected to the common junction of the other diodes is also poled to bleed the bias current of the transistor to override the control signal from the oscillator and prevent a change in the conductive state of the transistor. A number of drive circuits each connected to an output of a decoder control the visualization of the several segments of the liquid crystal indicator to visualize different alphanumerical characters in accordance with the coded binary input to the decoder.

3,750,141
CIRCUIT ARRANGEMENT FOR THE CONTROLLED ENERGIZATION OF A LOAD

Isidoro Poretti, Castiglione Olona, and Gabriele Bernasconi, Luisago, both of Italy, assignors to Societe Italiana Telecomunicazioni Siemens S. p. A., Milan, Italy

Filed Oct. 28, 1971, Ser. No. 193,438
Claims priority, application Italy, Nov. 18, 1970, 31876 A/70
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **4 Claims**

A binary-analog converter comprises a decoding matrix in the form of a ladder-type R/2R network having its several junctions connected to respective input circuits for energization by a signal representing a bit of a code word to be translated. Each input circuit includes a main transistor, continuously energized from a stabilized voltage source, and a pair of switching transistors in two parallel branches cascaded therewith, one branch leading to the associated junction point

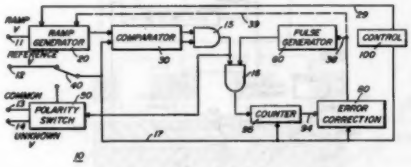


while the other one includes a dummy load of magnitude 2R/3. The two switching transistors are alternately turned on, depending upon the value of the corresponding bit.

3,750,142
SINGLE RAMP ANALOG TO DIGITAL CONVERTER WITH FEEDBACK

James A. Barnes, Scottsdale, and Donald R. Kesner, Tempe, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed June 9, 1972, Ser. No. 261,169
Int. Cl. G08c *5/00*
U.S. Cl. 340—347 CC **32 Claims**



The ramp voltage of an analog to digital converter is started at a point below zero and the output of a pulse generator is gated into a counter when the ramp voltage passes through zero. The pulse generator gate is closed when the ramp voltage passes through an unknown analog voltage to be measured or a reference voltage. A calibration cycle is incorporated wherein a known reference voltage should be represented by a known number of pulses. When the number of pulses is too high, the pulse generator may be slowed down or the rate of increase of ramp voltage may be speeded up. If there are too few pulses, the pulse generator may be speeded up or the rate of change of ramp voltage may be slowed down.

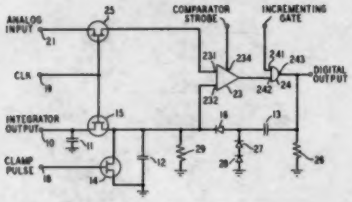
3,750,143
CHARGE PARCELING INTEGRATOR

Thomas Lawrence Osborne, Georgetown, Mass., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed July 18, 1972, Ser. No. 272,853
Int. Cl. H03k *13/22*
U.S. Cl. 340—347 AD **7 Claims**

A charge parceling integrator for use in delta modulation encoders and decoders has its output taken from a first, or integrating, capacitor. At the start of each cycle, the voltage across this capacitor is reduced by connecting it in parallel with a second, or decrementing, capacitor which was previously discharged. When a digital 1 is the input to the decoder

or the output of the encoder, a pulse is generated and applied through a third capacitor to the parallel combination of the first and second capacitors, thereby increasing the voltage



across them. The ratio of the capacitor values is chosen so that the increase in voltage across the integrating capacitor when a digital 1 occurs is twice the decrease at the beginning of each cycle.

3,750,144

TRANSCODER FOR DATA EXCHANGES BETWEEN A DELTA MODULATION SYSTEM AND A PCM SYSTEM

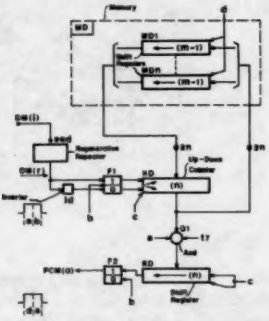
Daniel Bolus, Vincennes; Claude Paul Henri Lerouge, Maurepas, and Marc Andre Regnier, Aulnay-Sous-Bois, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,476

Claims priority, application France, Nov. 30, 1970, 7042943

Int. Cl. H04l *3/00*

U.S. Cl. 340—347 DD **2 Claims**



A transcoder is disclosed for exchanging time division multiplex data between a PCM system and a DM system. The basic circuit is a code circulation loop employing shift registers having a capacity for one PCM frame and wherein the codes are advanced by one address at each DM time slot. The DM clock is synchronized by the PCM clock.

3,750,145

LINEAR TIME DISPERSIVE CHANNEL DECODER

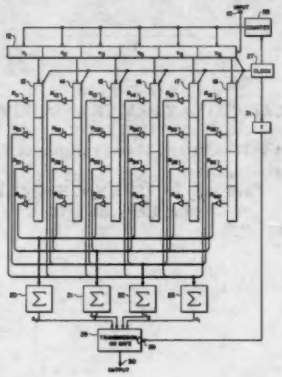
Theodore J. Klein, Monmouth, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 22, 1971, Ser. No. 155,423

Int. Cl. G06f *3/04*

U.S. Cl. 340—347 DD **7 Claims**

The channel decoder provides equalization of a linear time dispersed digital signal having groups of *k* bits dispersed over *n* bauds. The dispersed signal is sampled n times, once for each baud. The n samples are each stored in one register of a set of *n*. The n registers each contain *k* stages having an amplifier connected to the output of each stage to form an array of gain producing elements with positive, negative or zero gains. A set of *k* summing circuits sum the amplifier outputs in groups of *n*,



one group for each of the *k* stages. The outputs of the summing circuits are gated onto an output line by a clock.

3,750,146

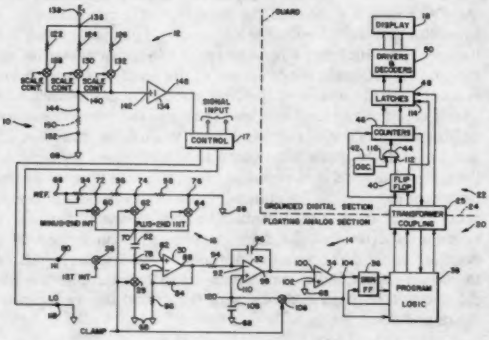
CAPACITIVELY COUPLED REFERENCE SIGNAL AND ASSOCIATED CIRCUITRY PARTICULARLY FOR ANALOG TO DIGITAL, DIGITAL TO ANALOG CONVERTERS AND THE LIKE

Paul G. Lucas, Sudbury, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed Dec. 13, 1971, Ser. No. 207,440

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **16 Claims**



A reference source is AC coupled to a converter for selectively providing both positive and negative reference signals to the converter. A reference signal potential is selectively applied to a first side of a first capacitor via a sequence of switches and a second side of the first capacitor is selectively connected to a common signal through a return switch. A first signal is presented at the second side of the first capacitor when a first switch of the sequence of switches and the return switch are closed. A second signal is presented at the second side of the first capacitor when the first and return switches are opened and a second switch of the sequence of switches is closed. The second signal presented at the second side of the first is the reference signal having a given polarity with respect to the common signal. Automatic zeroing of an offset voltage generated by an integrator and a comparator of the analog to digital converter is provided by a second capacitor serially connected between an input terminal of the integrator and the common signal, the integrator and comparator being con-

nected in a closed loop configuration. A voltage ratio measurement by the analog to digital converter, the ratio of the voltage across a first resistor having a known resistance to the voltage across a second resistor having an unknown resistance, represents the resistance value of the second resistor.

3,750,147

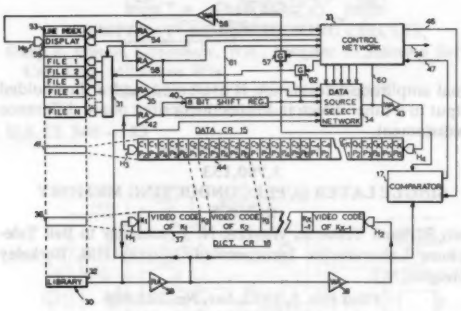
METHOD AND APPARATUS FOR CODE CONVERSION

Roland S. Gregg, Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Division of Ser. No. 798,896, Feb. 13, 1969. This application Apr. 5, 1971, Ser. No. 131,475

Int. Cl. H04l *3/00*

U.S. Cl. 340—347 DD **4 Claims**



A system for converting codes between a system data (e.g., ASCII) code format and a video display (e.g., dot matrix) code format is disclosed for use in a data display system employing a cathode ray tube. Conversion is accomplished one line of characters at a time by a procedure in which the character code groups to be converted (system to video or video to system) are circulated in a register in synchronism with a "dictionary" consisting of a series of all possible character code groups, each with its related code group of the other format. The circulating register for the dictionary is shorter than the register for the line of data to be converted such that with each cycle of the data circulating register, the dictionary is "precessed" (shifted) one character position in the line of data. When a correlation is found, the related code group of the other format is substituted from the dictionary into the data register. Thus, one line of data is converted in a number of cycles of the data register equal to or less than the number of different character code groups of either format in the dictionary register.

3,750,148

PULSE CODING SYSTEM

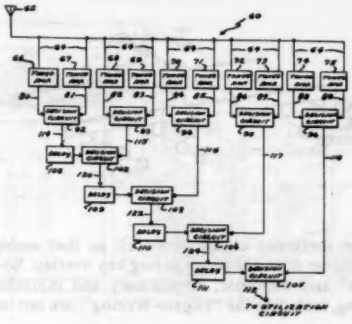
Jack E. Wilcox, Garrett, Ind., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1966, Ser. No. 549,778

Int. Cl. G08c *13/00*

U.S. Cl. 340—351 **1 Claim**

An encoder and cooperating decoder for the individual bits of serial binary information designed to increase the difficulty of jamming a communication system. In the encoder, the digital signal is applied to a tapped delay line with the signal at each tap used to key "on" a normally "off" oscillator and key "off" a normally "on" oscillator, all oscillators being of different frequencies and their outputs being applied to a common output circuit. At the decoder the oscillator signals are



separated by frequency selective detectors the outputs of which are sampled in a prescribed manner to determine whether a binary "1" or a binary "0" was sent.

3,750,149

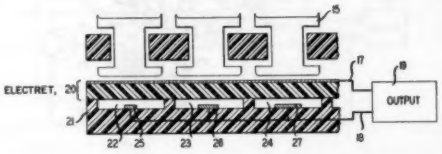
MULTI-UNIT ELECTRET TOUCH SELECTOR

Gerhard Martin Sessler, Summit; James Edward West, Plainfield, and Alfred E. Hirsch, Jr., Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 18, 1972, Ser. No. 218,726

Int. Cl. H04l *15/06*

U.S. Cl. 340—365 C **17 Claims**



Keyboard switching arrangements have been described that employ a plurality of independent back electrodes, supported at defined touch locations, and a single sheet of foil electret material supported in close proximity to the back electrodes. As the foil is subjected to a tactile force at one of the touch locations, it is displaced to generate a signal in a circuit connected to the electrode associated exclusively with that touch location.

3,750,150

PHOTOELECTRIC KEYBOARD FOR DATA INPUT DEVICES OR THE LIKE

Bernhard Cramer, and Helmut W. Schilling, both of Pforzheim, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 21, 1972, Ser. No. 273,930

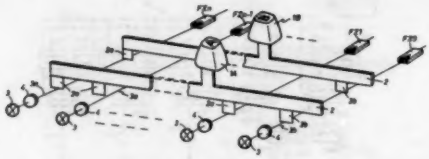
Claims priority, application Germany, Aug. 6, 1971, P 21 39 543.7

Int. Cl. G06f *3/02*

U.S. Cl. 340—365 P **6 Claims**

A photoelectric keyboard in which operation is achieved by insertion of a shutter in the light path between a source and a photocell in response to operation of a key. The shutter has

predetermined light transmissivity. Operation of a second key before the first is released inserts a second shutter in the light path and reduces the received light below a predetermined threshold at the photocell so that ambiguous code generation does not occur during key overlap. So-called "key locks" are, therefore, unnecessary and individual styles of writing, including the "Legato-Writing", are not inhibited.



3,750,151

THREE-PHASE ROTATING RING DISPLAY

Hans G. Dill, 2870 Tabago Pl., Costa Mesa, Calif.

Filed Aug. 25, 1971, Ser. No. 174,695

Int. Cl. G04b *19/20*

U.S. Cl. 340—379 **22 Claims**

A data display device which includes an indicia-bearing rotor driven by three multiple stators. In one embodiment the three stators extend collectively around the rotor. In another embodiment, each stator extends fully around the rotor. The rotor carries a plurality of equally spaced-apart magnetic domains upon which the three stators act in succession. One of the magnetic domains is purposely omitted, however, to permit magnetic detection of a predetermined position of the rotor.

3,750,152

PULSE-ECHO PHASE DISCRIMINATOR USING DELTIC PROCESSING

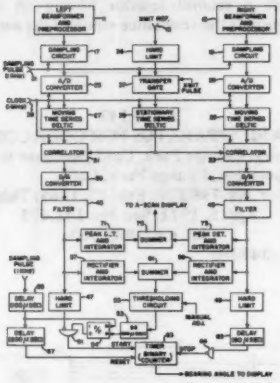
Lawrence F. Waful, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,802

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **5 Claims**

This disclosure is of a pulse-echo signal processor for deriving and displaying bearing angle information by measurement of the phase difference of echo signals received at two spaced points. Bearing angle determination is accomplished by processing signals received at each of the two spaced points through a moving time series DELTIC and correlating the time-compressed outputs with the transmitted signal which is correspondingly time-compressed in a stationary time series DELTIC. The correlation signals thus generated are combined to provide an unthresholded display output, in which the input signal amplitude information is preserved, and a thresholded output to a timer which indicates the desired phase difference measurement.



3,750,153

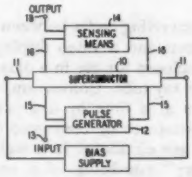
SINGLE LAYER SUPERCONDUCTING MEMORY DEVICE

Louis Richard Testardi, Warren, N. J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 3, 1972, Ser. No. 223,086

Int. Cl. H03k *17/84*; G11c *11/44*

U.S. Cl. 340—173.1 **8 Claims**



The disclosed memory device is composed of an array of bistable units. The operational portion of each bistable unit is a strip of superconductor material which can, when suitably d-c biased, be switched between a stable superconducting state and a stable resistive state by the passage of current pulses. A current pulse in the same sense as the bias current switches the unit to a stable resistive state. A pulse of opposite polarity produces the superconducting state. Arrays can be constructed to perform memory and logic functions.

3,750,154

BUBBLE DOMAIN CHIP ARRANGEMENT

George S. Almasi, Katonah, N.J., assignor to International Business Machines Corporation, Armonk, N.Y.

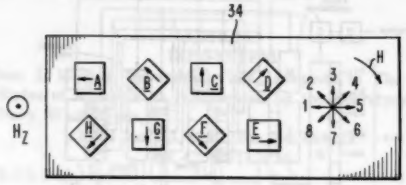
Filed May 1, 1972, Ser. No. 249,622

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 TF **22 Claims**

A space displacement arrangement of magnetic domain chips with respect to each other, which allows packaging with a minimum number of memory interconnections and low operating power. In addition, reduction of the number of preamplifiers and the number of sensors is achieved. Each chip contains bubble domain devices thereon, and provides a complete bubble domain memory system. Spatially rotating the chips with respect to one another means that the same

reorienting magnetic drive field will have a time displaced effect on each of the chips. That is, each chip will see the reorienting drive field at a different time. In this manner, multiplexing on a chip-to-chip basis is achieved. The chips can be arranged so that no interconnection cross-overs result, even though they are rotationally displaced with respect to one another.

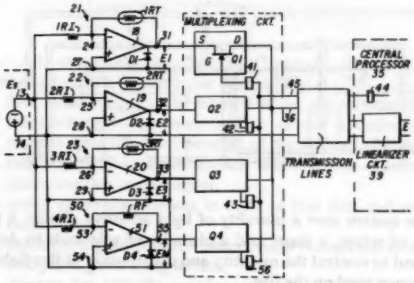


3,750,155

TEMPERATURE MONITORING CIRCUIT

Gary F. Oman, Greendale, Wis., assignor to Johnson Service Company, Milwakee, Wis.

Filed Aug. 3, 1971, Ser. No. 168,669
Int. Cl. G08c *15/06*
U.S. Cl. 340—183 **3 Claims**



A data acquisition system including a plurality of temperature monitoring circuits, each including an operational amplifier having a resistance-type temperature sensing element connected in a feedback loop of the amplifier and operable to provide an output voltage that is a function of the temperature measured by the circuit, a reference source which supplies a reference voltage to the amplifiers, enabling each amplifier to provide a constant current to the sensing element, a reference source monitoring circuit operable to provide an output voltage proportional to the reference voltage, and a multiplexing circuit for selectively extending the output voltages provided by the temperature monitoring circuits and the reference source monitoring circuit to a central processor. The output voltage provided by the reference source monitoring circuit is processed at the central processor to permit adjustment of the output voltages extended to the central processor from the temperature monitoring circuits to compensate for changes in the amplitude of the reference voltage.

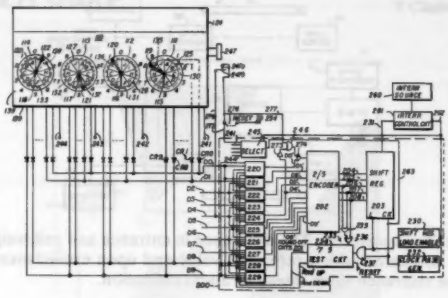
3,750,156

DECODER CIRCUITS FOR SHAFT ENCODER APPARATUS

Dennis J. Martell, West Chicago, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Mar. 1, 1971, Ser. No. 119,589
Int. Cl. G08c *19/16*
U.S. Cl. 340—203 **15 Claims**

An analog-to-digital converter for converting angular positional information of a shaft associated with a dial register of a meter into binary coded outputs includes a non-contacting encoder for providing coded output signals representing ten digit positions and ten interdigital positions of the shaft and output decoding circuits for providing round off of interdigital position codes and conversion of the coded signals to a two-out-of-five code. Cathodic protection monitoring circuits provide outputs over the decoding circuits representing the cathodic protection information which indicates a condition of apparatus associated with the meter.

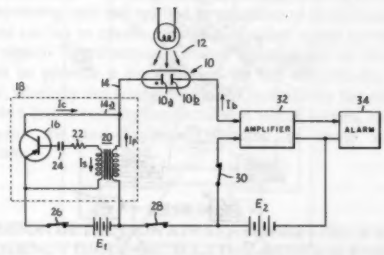


3,750,157

LIGHT DETECTION MONITORING DEVICE

Pierre Kaltenbach, 965 5th Ave., New York, N.Y.

Filed Apr. 30, 1971, Ser. No. 138,905
Int. Cl. G08b *17/10*
U.S. Cl. 340—227 R **13 Claims**



A light detection monitoring device includes a gaseous discharge tube for converting incident light into an electric signal, and a blocking oscillator. The oscillator, which is coupled to one of the electrodes of the tube and is enabled by the electric signal produced by the discharge tube, supplies short pulses which add to the discharge current to effect cumulative ionization of the gas in the tube and the attendant generation of high frequency waves. The increased discharge current and the high frequency waves are then employed to trigger local and remote alarm devices, respectively.

3,750,158

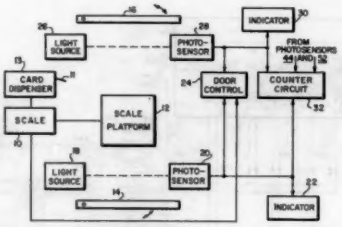
WEIGHT SENSITIVE SECURITY SYSTEM

Evangelos M. Anastassakis, c/o Maxham & Schurgin, One Boston Place, Boston, Mass.

Filed June 2, 1972, Ser. No. 259,010
Int. Cl. G08b *21/00*; **G01g** *19/00, 23/18*
U.S. Cl. 340—272 **9 Claims**

A security system for detection of the unauthorized removal of articles from a controlled area in which the weight of an individual is determined upon entrance into and exit from a controlled area, the difference between entrance and exit weights being employed to determine whether items are being removed. Upon entrance into a controlled area, an individual's weight is determined and a coded card provided in-

dicating the entrance weight. Upon exit from the controlled area, the individual is again weighed and the exit weight compared with the entrance weight decoded from the card by card



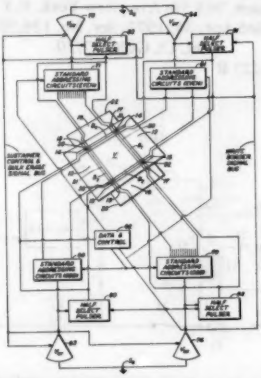
reading apparatus. The difference in entrance and exit weight is compared with a reference value and upon exceedance of the reference value causes an alarm indication.

3,750,159

BULK ERASE SYSTEM FOR GAS DISCHARGE DISPLAY PANELS

David S. Wojcik, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1971, Ser. No. 211,512
Int. Cl. G08b 5/36
U.S. Cl. 340—324 M **6 Claims**



In gaseous discharge display panels of the crossed conductor matrix type wherein the conductors are non-conductively coupled to the gas border discharge sites are normally maintained on for information or data display site conditioning purposes. According to the invention, rather than maintaining the border sites on while bulk erasing the entire panel, in the process of this invention, the border sites as well as the panel display areas are erased and then the border is rewritten. Circuitry is provided for inserting in the border conductors locating the border sites a voltage with the sustainer signal voltage following a bulk erase of all the signals due to sustainer control.

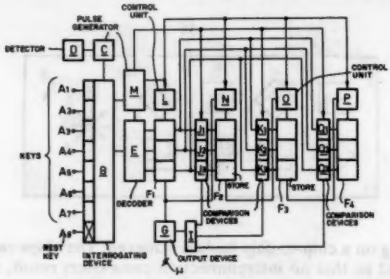
3,750,160

KEYBOARD WITH ROLL-OVER FEATURE

Johannes Mattheus Elzinga, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,415
Claims priority, application Netherlands, Nov. 14, 1970, 7016723
Int. Cl. G06f 3/02
U.S. Cl. 340—365 E **4 Claims**

In a keyboard two or more keys may be jointly depressed. The keys are successively interrogated and the decision that a "new" key is interrogated is obtained in that in this event there is no equality with the code data of keys contained in a



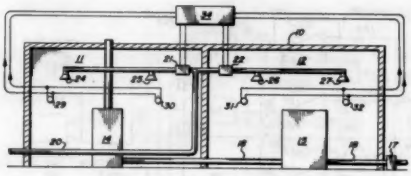
store. When the keys are released the code data of this key are erased or rendered inoperative.

3,750,161

FIRE DETECTOR AND EXTINGUISHER SYSTEM

Lloyd L. Teeters, Star Rt., Cordes Lake, Mayer, Ariz.

Filed June 5, 1972, Ser. No. 259,481
Int. Cl. G08b 19/00
U.S. Cl. 340—418 **8 Claims**



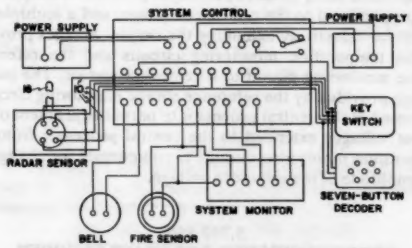
The system uses a plurality of light sensitive diodes, a plurality of relays, a timer and a plurality of solenoids to detect fire and to control the quantity and distribution of fire fighting substance used on the fire.

3,750,162

ALARM SYSTEM

William Joe Seaton, Kearns, Utah, assignor to Garside Corporation, Salt Lake City, Utah

Filed July 23, 1970, Ser. No. 57,664
Int. Cl. G01s 9/02
U.S. Cl. 343—5 PD **2 Claims**



An alarm system the operation of which is controlled by a key switch and, if desired, by a seven-button decoder. Several abnormality detecting devices are connected to a system control. The detecting devices may consist of a wide variety of sensors, two types of which are mentioned in this specification. Upon receipt of an alarm signal from a detecting device, some of the system control circuitry interrogates that signal

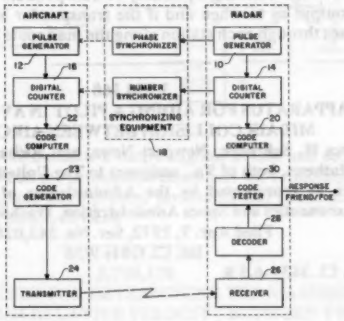
and, as a function of that signal, actuates the output circuitry of the system control. The illustrated output circuitry specifically comprises an audio oscillator and a light blinking circuit to provide both audio and visual alarm outputs.

3,750,163

IFF-SYSTEM

Klaus J. Hecker, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1962, Ser. No. 168,287
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R **7 Claims**



6. An electronic identification system for determing whether a target is friend or foe comprising:

a first radar means to be carried in an aircraft capable of transmitting to an interrogation center a coded signal representing the identification of the aircraft, and second radar means located at the interrogation center for analyzing this coded signal,

b. pulse generating means in each of said first and second radar means,

c. identical digital counter means, each connected to one of said pulse generating means,

d. means for initially synchronizing the pulse generating means and digital counter means in said second radar means with the pulse generating means and digital counter means in said first radar means, such that the pulse generating means in said second radar means will not differ substantially from the pulse generating means in said first radar means and the digital counter means in each of said first and second radar means will indicate the same number,

e. code computers, each connected to one of said digital counter means, the number from said digital counter means in each of said first and second radar means being fed to respective code computers each of which perform a sequence of identical mathematical operations and have identical outputs which are a sequence of random code numbers, the output of the digital counter means and the code computers changing at a desired rate,

f. adder means and code generating means connected to the code computer in the first radar means, the output of said code computer in said first radar means being fed to said adder means where an identification number is added thereto, the resultant number being converted into a code signal by said code generating means, and means for transmitting said code signal to said second radar means,

g. means in said second radar means for receiving the code signal transmitted from said first radar means,

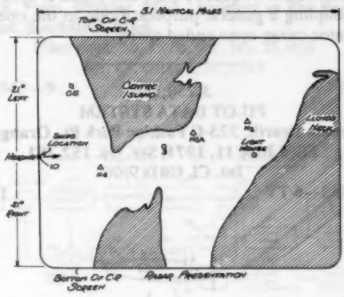
h. decoder means in said second radar means for restoring the received code signal into its original resultant number and means for subtracting the output of the code computer in the second radar means therefrom, whereby an aircraft carrying said first radar means will be identified by its identification number.

3,750,164

MARINE RADAR WITH T-V RECEIVER DISPLAY

Tore N. Anderson, High Ridge Rd., Brookfield Center, Conn.

Filed July 20, 1971, Ser. No. 164,348
Int. Cl. G01s 9/00
U.S. Cl. 343—5 R **8 Claims**



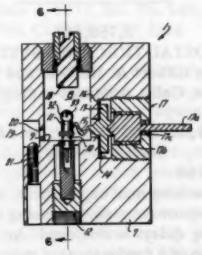
A marine radar system for small boats, the system making use of a conventional T-V receiver for the display of the radar picture. The radar system includes an antenna adapted to periodically scan a predetermined azimuthal sector with a beam of radar pulses whose repetition rate corresponds to the horizontal line scanning rate of the receiver, and means to generate a local carrier whose frequency corresponds to that of an unoccupied channel of the receiver. Echo signals produced by targets lying within the sector are intercepted by the antenna. These echo signals together with horizontal sync signals corresponding in frequency to the repetition rate of the radar pulses, and vertical sync signals corresponding to the antenna scanning rate are applied as modulation components on the local carrier to create a composite video signal simulating a T-V signal. The composite video signal is fed to the T-V receiver to provide a presentation on the cathode-ray tube thereof, whereby the triangular sector scanned by the radar is converted into a rectangular picture in which targets close to the radar site are expanded relative to those remote therefrom.

3,750,165

INTRUSION DETECTION APPARATUS HAVING A HIGH FREQUENCY DIODE OSCILLATOR-MIXER ELEMENT

James R. Bailey; Carl F. Klein; Lawrence B. Korta, and Donald F. Pridemore, all of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 16, 1971, Ser. No. 172,052
Int. Cl. G01s 9/02; G08b 13/22
U.S. Cl. 343—5 PD **14 Claims**



An intrusion detector detects motion of a human intruder into a selected volumetric space. An oscillator-detector avalanche or impatt diode operating above 4GHz is mount within an open ended conductive cavity of a coaxial line construction to define the active transmitting and mixing element

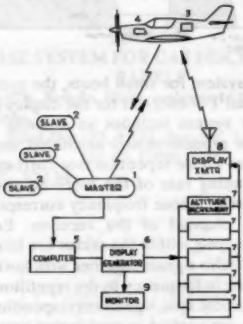
of an oscillator-mixer establishing an RF field in the selected space and receiving the motion related signals via a common antenna. The diode is exposed to both the transmitted and the echo signal and produces a Doppler frequency output signal which is connected to an alarm. The system antenna and a load coupling impedance transformer are selected to optimize the magnitude of the Doppler motion signal response sensitivity. The microwave frequency oscillator signal is modulated by loosely coupling a general purpose diode to the open end of the oscillator-mixer open ended cavity.

3,750,166

PILOT DATA SYSTEM

James Slocum Dearth, 323-C Fashion Park Pl., Orange, Calif.

Filed June 11, 1971, Ser. No. 152,201
Int. Cl. G01s 9/00
U.S. Cl. 343—6 TV **15 Claims**



This Pilot Data System is capable of automatically providing the pilot of a vehicle continuous, immediate, information on the geographic position of his vehicle, the geographic position and movement of other craft, the location and height of natural and man-made obstacles, and other pertinent data.

This system is primarily intended for use by aircraft, but is not restricted to any specific type of vehicle. When used for aircraft, this system automatically determines all aircraft positions within its coverage area by a combination of low-cost aircraft data link and a ground station. It sorts aircraft by altitude, generates synthetic displays for increments of altitude, together with map underlays on which the aircraft appear, and transmits the resulting displays for pilot use. Each display gives the pilot a continuous, dynamic, geographically correct, picture of all air traffic at the altitude he selects. His own aircraft, suitably identified, appears on the display increment for his altitude.

The system also provides a "Search and Rescue" system.

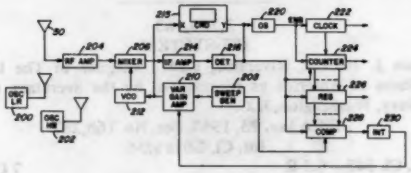
3,750,167

POSTAL TRACKING SYSTEM

John B. Gehman; Gilbert A. Herlich, and Seigfried Mikuteit, all of San Diego, Calif., assignors to General Dynamics, San Diego, Calif.

Filed July 22, 1971, Ser. No. 165,241
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 SS **28 Claims**

A system for tracking mail bags, letters, and parcels through a post office to determine mail processing times accurately as well as processing delays is disclosed. An unobtrusive transponder in the form of a card is located in letters or mail bags to be tracked. A number of stations are located along the route of the mail bags and irradiate these bags. Each station includes an array of three antennas disposed in mutually orthogonal relationship so as to irradiate the transponder notwithstanding its position. When irradiated by ultra high frequency (UHF) energy, the transponder is activated and transmits a VHF signal. The transponder includes a transmitting circuit which may be selectively set to transmit a signal having a frequency uniquely identifying the transponder. The system includes a



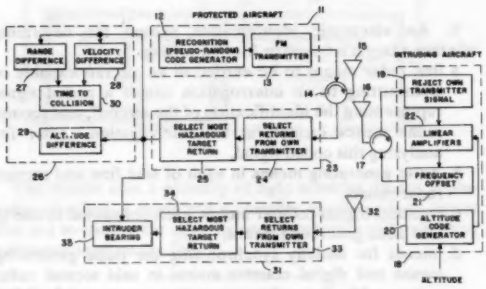
receiver for tracking a plurality of transponders and providing an output as to when and if the transponder is tracked as it passes through each station along the mail route.

3,750,168

APPARATUS FOR AIDING A PILOT IN AVOIDING A MIDAIR COLLISION BETWEEN AIRCRAFT

James H. Schrader, Newport News, and Richard H. Couch, Mathews, both of Va., assignors to The United States America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 7, 1972, Ser. No. 242,028
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R **11 Claims**



This invention is an apparatus for aiding a pilot in avoiding a midair collision between aircraft. A protected aircraft carries a transmitter, a transponder, a receiver and a data processor; and an intruding cooperating aircraft carries a transponder. The transmitter of the protected aircraft continuously transmits a signal to the transponders of all intruding aircraft. The transponder of each of the intruding aircraft adds the altitude of the intruding aircraft to the signal and transmits it back to the receiver of the protected aircraft. The receiver selects only the signal from the most hazardous intruding aircraft and applies it to the data processor. From this selected signal the data processor determines the closing velocity between the protected and intruding aircraft, the range between the two aircraft, their altitude difference and the time to a possible collision. Also, the bearing of the intruding aircraft can be determined.

3,750,169

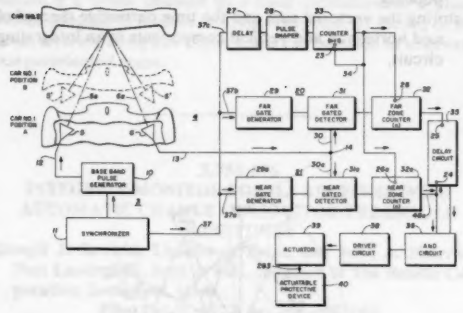
VEHICULAR SAFETY SYSTEM

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 13, 1972, Ser. No. 234,059
Int. Cl. G01s 9/04
U.S. Cl. 343—7 ED **14 Claims**

A vehicular safety apparatus includes radio sensor means for the detection of an impending collision immediately prior to contact of the protected vehicle with another object and for actuation of restraining or other safety devices for protecting

occupants of the vehicle when the crash event actually occurs. Base-band radio pulse transmission and reception presence sensor devices with first and second zone echo signal gating



channels provide distinctive output signals at first and second distances between the protected vehicle and the reflecting object, which signals when present simultaneously cause actuation of the protective devices.

3,750,170

VELOCIMETER FOR DETERMINING THE MAXIMUM OR MINIMUM RELATIVE VELOCITY BETWEEN TWO BODIES

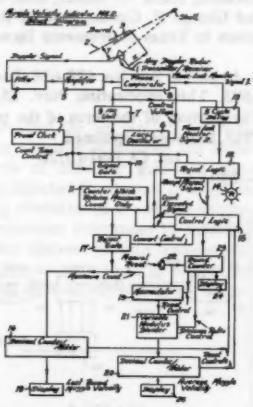
David John Lyne Brown, Bayview, New South Wales, Australia, assignor to The Commonwealth of Australia, c/o The Secretary Department of the Navy, Canberra, Australia

Filed Aug. 13, 1971, Ser. No. 171,586

Claims priority, application Australia, Aug. 14, 1970, 2196/70

Int. Cl. G01s 9/44

U.S. Cl. 343—8 **16 Claims**



A method and apparatus for determining maximum or minimum relative velocity between two bodies as measured radially from one of the bodies, which comprises a transmitter/receiver complex for the production of a signal the frequency of which is proportional to the relative velocity between the two bodies by means of the Doppler principle characterized in that counting is carried out by recording the number of cycles which occur in a number of fixed consecutive periods of time and automatically retaining in a memory only the maximum number of cycles which occur in a fixed period of time, whereby when a decrease in velocity occurs the last retained measurement indicates maximum velocity reached. For determination of minimum velocity, resort is made to period measurement, i.e., a maximum number of cycles of a constant frequency signal, occuring during periods of Doppler signal cycles, is retained.

3,750,171

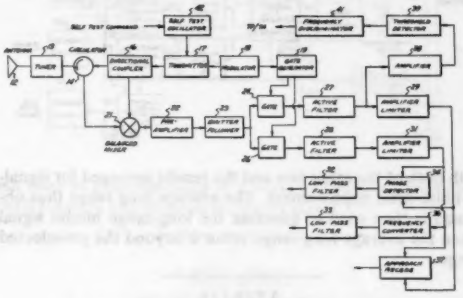
DIPLEXED MULTI-FREQUENCY CW DOPPLER RADAR

William R. Faris, Berkley, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 24, 1970, Ser. No. 75,056

Int. Cl. G01s 9/24, 9/46

U.S. Cl. 343—9 **14 Claims**



This invention relates to a diplexed multi-frequency CW radar for use in the measurement of range and relative velocities between two vehicles. The radiated signal is modulated so that several frequencies are transmitted on a time-sharing basis. Doppler signals resulting from the reception of energy reflected from a target are gated to produce two composite doppler signals. Range to the target is proportional to the phase angle between the composite doppler tones and range rate is proportional to the frequency of the composite signal. The composite doppler signal can be represented as the vectorial summation of two component signals. The phase relationship between the two composite signals establishes range for all target ranges. However, the composite vectors are reduced to zero at a preselected maximum range and become ambiguous beyond that range. This provides range cut-off for the system. Ambiguous signals existing because of reflections from targets beyond the maximum range are below the threshold level of the system, and therefore, are of no consequence to the system.

3,750,172

MULTIFREQUENCY CW RADAR WITH RANGE CUTOFF

Carl P. Tresselt, Detroit, Mich., assignor to The Bendix Corporation, Southfield, Mich.

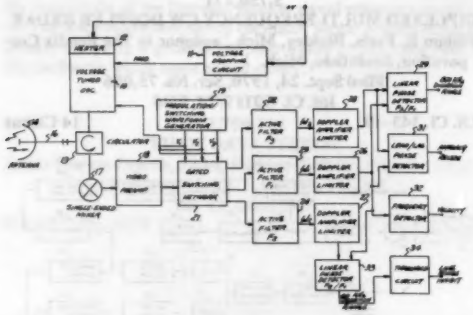
Filed June 2, 1971, Ser. No. 149,265

Int. Cl. G01s 9/38, 9/44

U.S. Cl. 343—12 R **30 Claims**

This invention is directed to a CW radar system having range cutoff capability to render it insensitive to targets beyond a preselected range. Three frequencies are sequentially transmitted and reflections from a relatively moving target received to produce three doppler frequencies. The doppler shifts on the highest and lowest transmitted frequencies are phase compared to indicate range between the target and the antenna, which is unambiguous out to a preselected range. By noting the leading-lagging relationship of these two doppler frequencies, phase can be used below the ambiguous range to indicate whether the target is approaching or receding from the antenna. The third transmitted frequency lies between the other two, and produces an additional doppler frequency which can be phase compared with either of the other two doppler signals. Since the carrier frequency difference is lower in this latter comparison, the ambiguity in indicated range will occur at a greater distance. The lower dif-

ference frequency can accordingly be used to generate an inhibit signal for targets which fall near or beyond the ambiguity point of the first, higher deviation range measurement channel. Alternately, the third doppler can be phase compared



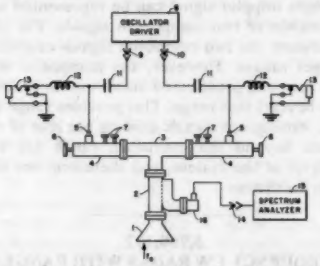
with both of the other two and the results averaged for signal-to-noise ratio improvement. The average long range thus obtained is then used to generate the long-range inhibit signal when the average long-range value is beyond the preselected range.

3,750,173

FREQUENCY TRANSLATING REPEATER (BOOMERANG) USING SINGLE-SIDEBAND TECHNIQUES

Norbet E. Tackman, Corona, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 29, 1970, Ser. No. 64,913
Int. Cl. G01s 7/40
U.S. Cl. 343—17.7 **7 Claims**



A device for returning or reflecting an incident RF signal translated in frequency by single-sideband techniques; the transmitter and receiver local oscillator frequencies are identical.

3,750,174

AIDED ANGLE TRACKING DEVICE

Raymond E. Belluck, Flushing, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1963, Ser. No. 325,189
Int. Cl. G01s 9/02
U.S. Cl. 343—18 E **8 Claims**

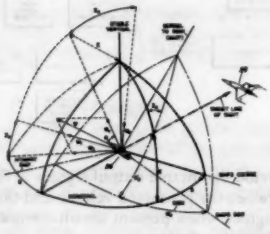
2. A method of tracking a target in the presence of enemy jamming which employs a radar tracker and comprises the steps of

deriving from a radar receiver traverse and elevation components of an angular velocity signal representative of said target angular velocity with respect to said tracker immediately prior to enemy jamming of said tracker,

applying said traverse and elevational components to a coordinate conversion means for converting said components into stabilized horizontal and vertical components of said angular velocity signal,

vectorially summing said horizontal and vertical components,

storing the vectorial sum and the time derivative thereof of said horizontal and vertical components in an integrating circuit,



applying signals from said integrating circuit to a function generator for generating an angular rate signal W which satisfies the equation

$$\ddot{W} = 3/2\,(\dot{W}^3/W) - 2\ddot{W}^3$$

where W represents the second time derivative of W and W represents the first time derivative of W

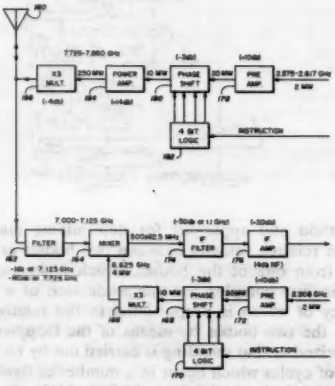
and applying said last-named signal to circuitry coupled to said radar tracker enabling said tracker to track at said last-named angular rate during enemy jamming.

3,750,175

MODULAR ELECTRONICS COMMUNICATION SYSTEM

Robert M. Lockerd; Mark W. Smith, both of Dallas; Ray E. Cooper, and George E. Goode, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 690,638, Dec. 14, 1967, Pat. No. 3,353,693. This application Nov. 25, 1969, Ser. No. 879,775. The portion of the term of the patent subsequent to Jan. 5, 1988, has been disclaimed.
Int. Cl. H01q 3/26
U.S. Cl. 343—100 SA **4 Claims**



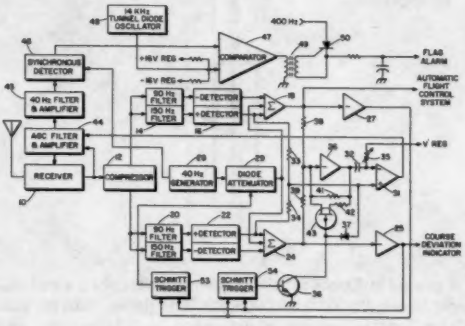
A communication system including a plurality of radiating elements formed into an antenna array for transmitting and receiving communication frequency signals and employing a

central processor to generate the transmitted signals and process the received frequencies through a manifold arrangement. Each radiating element connects to the manifold through a module made up of integrated microwave circuitry including a mixer coupled to a local oscillator and a phase shifter coupled to a beam steering computer. By means of the beam steering computer the antenna can be made to scan various preselected areas.

3,750,176
INTEGRITY MONITOR FOR ILS RECEIVER WITH AUTOMATIC CHANGE OF MONITOR THRESHOLD SENSITIVITY

Joseph J. Sawicki, Lighthouse Point, and John A. Sharrow, Fort Lauderdale, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 5, 1971, Ser. No. 186,745
Int. Cl. G01s *1/14*
U.S. Cl. 343—107 **8 Claims**



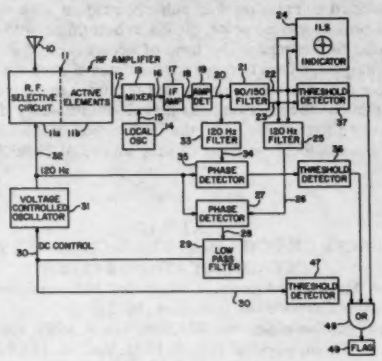
An integrity monitor for an aircraft Instrument Landing System receiver in which malfunctions are detected by comparing the outputs of identical guidance signal channels. Tracer signals are injected to prevent total guidance channel failure from being mistaken as a valid condition. Automatic means adjust comparison tolerances to permit a greater difference in guidance channel outputs without alarm when the aircraft is in the clearance area and to reduce the permissible difference when the aircraft is on-course.

3,750,177
INSTRUMENT LANDING SYSTEM RECEIVER MONITOR

Howard B. Rooks, Marion, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed May 18, 1971, Ser. No. 144,502
Int. Cl. G01s *1/08*
U.S. Cl. 343—108 R **9 Claims**

A phase-amplitude detection system employing a tonal tracer signal imposed on the received ILS carrier signal provides warning as concerns receiver malfunction ahead of the output tone filter rectifiers. Means for comparing tracer signal component, as extracted at selected points within the receiver, with the tracer signal per se annunciates defects in the receiver processed tracer signal (which by necessity must also occur to the desired signal). The integrity of the guidance signal output is preserved by employing the receiver tone output filter as a discriminator in a phase locked loop controlling the frequency and phase of the tracer signal.



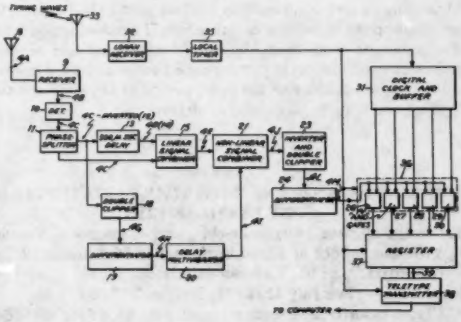
ERRATUM

For Class 343—112 see:
Patent No. 3,750,188

3,750,178
RADIO LOCATION DETECTION SYSTEM

George D. Hulst, Verona, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 22, 1959, Ser. No. 815,744
Int. Cl. G01s *5/06*
U.S. Cl. 343—112 R **12 Claims**



1. In a radio location detection system for locating the geographical position of a source of discrete radio frequency signals having a plurality of spaced radio receiving stations at known geographical locations; the combination of a timing means at each said receiving station in time synchronism with the timing means of said other stations, means to receive said discrete radio frequency signals, means to detect from each said discrete received signal the envelope of said signal, means to invert and delay said detected envelope, means to combine said inverted and detected envelope of given amplitude with said detected envelope at a different amplitude to produce a first combined signal having a positive portion and a negative portion with a crossover point at the zero axis occurring a predetermined time after the arrival at said receiver of said discrete radio signal, means to derive from said detected envelope a gating pulse and means to combine said gating pulse with said first combined signal to produce a second combined

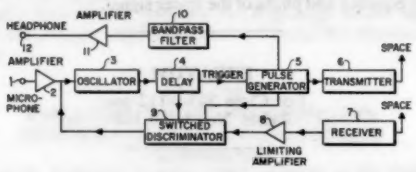
signal containing all of said negative portion and part of said positive portion of said first combined signal and including said zero crossover point, means to derive from said second combined signal a marker pulse coincident with the time of said zero crossover point, means to determine with reference to said timing means the time of occurrence of said marker pulse signal, means to compare the times of occurrence of corresponding marker pulses at said receivers to derive the time differences therebetween, said time differences indicating at least two hyperbolic lines, the intersection of which provides the geographical position of said source of radio frequency signal.

3,750,179

SINGLE CHANNEL DUPLEX SPACE LINKED PULSE COMMUNICATIONS SYSTEM

John Merle Tewksbury, Lutherville, Md., assignor to The Bendix Corporation, Baltimore, Md.

Continuation of Ser. No. 873,869, Nov. 4, 1969, abandoned.
This application Nov. 8, 1971, Ser. No. 196,827
Int. Cl. H04b 7/20
U.S. Cl. 343—175 **39 Claims**



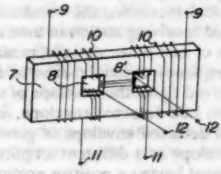
In a single channel, polystation duplex space linked pulse communication system, keying of each of the continuously operating transmitters is controlled by a local oscillator. Each cycle a local of oscillator is modified by pulses received from other stations, to reduce or increase the period as needed to produce identical periods in all oscillators. Since the pulses from other stations received at a local station are not perceptible during its own transmission, and no control is then exerted, an equilibrium condition is immediately established in which the departure from coincidence of transmitted and received pulses at each station is proportioned to its need for control. Intelligent modulation of the pulse period at any station is then evident and may be recovered at all stations.

3,750,180

MAGNETIC ANTENNA WITH TIME VARIATIONS OF CORE PERMEABILITY

Kyohei Fujimoto, Fugisawa-shi, and Katsuhiko Tamura, Yokohama, both of Japan, assignors to Matsuchita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed July 21, 1972, Ser. No. 273,694
Claims priority, application Japan, July 22, 1971, 46/55003
Int. Cl. H01q 7/08
U.S. Cl. 343—788 **5 Claims**



An antenna system using a magnetic core provided with coils wound thereon such as to cause time variations of the permeability of the core itself is disclosed. With the time variations of the core permeability the inductances of the antenna coil and output coil wound on the core is changed for parametric amplification of the reception signal to obtain amplified antenna output. Also, by using a plurality of such antenna systems an array antenna having desired and controllable directional characteristics are obtained.

3,750,181

GROUND INDEPENDENT ANTENNA

John A. Kuecken, Pittsford, N.Y., assignor to Radionics, Incorporated, Webster, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,042
Int. Cl. H01q 9/20, 1/50
U.S. Cl. 343—790 **12 Claims**

A ground independent UHF antenna is described which has upper and lower coaxial radiators. The upper radiator provides a coaxial feed cavity presenting both inductance and capacitance so as to provide a broad bandwidth of operation. The lower radiator defines a choke cavity which affords ground independent operation.

3,750,182

SUPPRESSED SIDELOBE EQUAL BEAMWIDTH MILLIMETER HORN ANTENNA

Nicholas P. Kernweis, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1972, Ser. No. 278,852
Int. Cl. H01q 13/00
U.S. Cl. 343—783 **3 Claims**

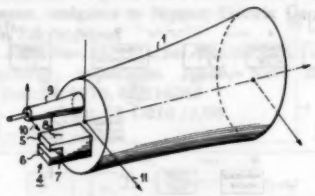
A millimeter horn antenna apparatus for providing millimeter wave frequencies with suppressed sidelobes and equal beamwidths in the orthogonal electric and magnetic planes.

3,750,183

MULTIMODE ANTENNA SYSTEM

Serge Drabowitch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 15, 1971, Ser. No. 208,060
Claims priority, application France, Dec. 22, 1970, 7046249
Int. Cl. H01q 13/00
U.S. Cl. 343—786 10 Claims



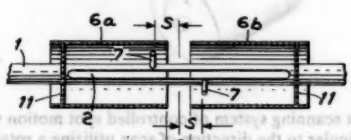
A waveguide structure, designed to operate as a wide-band multimode antenna, has an elongate main waveguide section centered on an axis and terminating at a radiating aperture, an intermediate waveguide section of lesser width joined to that main section, and a pair of still narrower input sections feeding the intermediate section, these input sections being cophasally or antiphasally excited with the same fundamental mode TE_{10}. A first discontinuity, at a transverse plane representing the junction between the input and intermediate waveguide sections, and a second discontinuity, at a transverse plane representing the junction between the intermediate and main waveguide sections, give rise to mixed TEM modes which come into existence at the first or the second discontinuity, depending upon wavelength; at the originating discontinuity, the mixed mode is in phase with the generating fundamental mode so that, with proper dimensioning of the length of the main waveguide, they will recombine cophasally at the radiating aperture.

3,750,184

SUPER-BALANCED FEED-THROUGH DIPOLE ANTENNA

John A. Kuecken, Pittsford, N.Y., assignor to Internation Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 12, 1972, Ser. No. 217,201
Int. Cl. H01q 9/16
U.S. Cl. 343—792 13 Claims



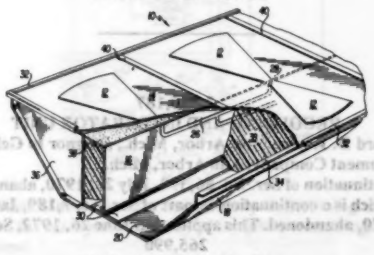
The invention provides a novel LOS dipole antenna arrangement which permits substantial improvement in pattern characteristics by correspondingly reducing spurious coupling to adjacent structure, which may occur particularly where the antenna is situated closely adjacent to unrelated structure in a space-restricted environment. Pattern improvement is based on the principle of the antenna's symmetry being rigorously maintained, wherein a pair of adjacently arranged cylindrical radiators are fed by a double-ended balun structure created from the supporting and cable feed-through antenna mast. This balun feed assembly comprises a pair of oppositely arranged slots within the antenna cylindrical radiators, with each conductor of the coaxial feed cable running to the balun being coupled to either side of one of the slots proximate the center thereof. The excitation energy is transferred to the cylindrical radiators by way of symmetrically placed radial posts extending from either side of the energy-coupled slot to the inside of the cylinders.

3,750,185

DIPOLE ANTENNA ARRAY

Gary E. Evans, Hanover, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1972, Ser. No. 218,789
Int. Cl. H01q 21/12
U.S. Cl. 343—814 6 Claims



An antenna array is disclosed for generating and directing a narrow beam or beacon of wave energy along a predetermined path. Illustratively, the antenna array includes a plurality of dipole elements disposed upon a substantially flat support member and connected by a distribution circuit through a single transition to an axial input cable. Significantly, the distribution circuit takes the form of an insulating member upon either side of which are disposed electrically conductive elements for establishing across the dielectric member a balanced conduit for the passage of high frequency signals (or waves) to each of the dipole elements. Further, the distribution circuit serves to divide and to appropriately distribute the input signal to each of the dipole elements of the array. A shell housing is disposed about the distribution circuit to provide in combination with the plurality of dipole elements an effective shielding therefore and also to provide a reflective surface to appropriately direct the discrete wave generated by each of the dipole elements.

3,750,186

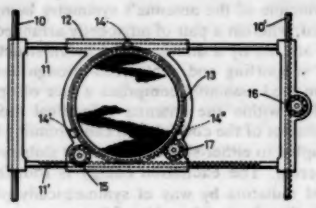
METHOD AND APPARATUS FOR MAKING A RECORD CARRIER FOR AUTOMATIC EMBROIDERY SEWING MACHINE

Isamu Sakamoto, Nishinomiya, Japan, assignor to Konan Camera Laboratory Company Limited, Kobe City, Japan

Filed May 11, 1970, Ser. No. 36,111
Int. Cl. G01d ; D05b 21/00
U.S. Cl. 346—1 2 Claims

Method and apparatus for making a record carrier for an automatic embroidery sewing machine to detect amounts of

longitudinal, lateral and angular movements of a cloth frame moving device, amplitude detection of the machine needle and start-stop instructions for the machine, with rotary pulse



generators that generate pulses for the various movements. A magnetic record carrier records the pulse trains taken as outputs of the pulse generators.

ERRATUM

For Class 346—23 see:
Patent No. 3,749,868

3,750,187

RECORDING AND INTEGRATOR UNIT

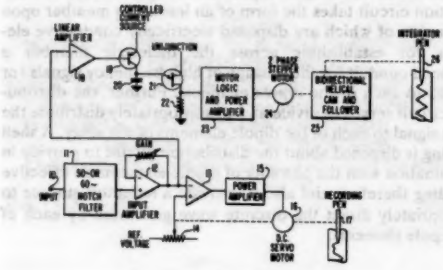
Richard D. Keefer, Ann Arbor, Mich., assignor to Gelman Instrument Company, Ann Arbor, Mich.

Continuation of Ser. No. 56,390, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 7,189, Jan. 30, 1970, abandoned. This application June 26, 1972, Ser. No. 265,990

Int. Cl. G01d *1/04, 9/30*

U.S. Cl. 346—49 **15 Claims**

The unit disclosed has independently operated signal and integrator pens which provide separate traces on the chart paper of a curve representing the changes over a period of



time in the magnitude of the input signal and the area under the input signal curve. The area curve is in the form of a zigzag integration line which requires only a narrow strip of the total chart width. This zigzag trace is produced by automatically reversing the pen direction as soon as it has traversed a certain predetermined recording width. The unit has an electronic integrator circuit with an electro-mechanical output which controls the integrator pen.

3,750,188

METHOD AND APPARATUS FOR RADIO NAVIGATION

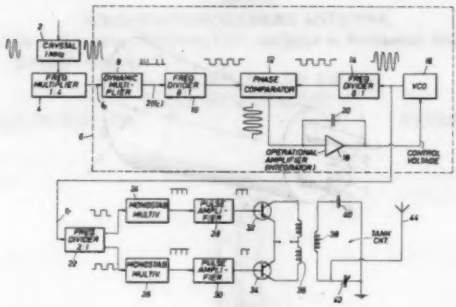
Friedhelm K. Sender, Hannover, Germany, assignor to Prakla Seismas GmbH, Hannover, Germany

Filed July 1, 1969, Ser. No. 838,174

Claims priority, application Germany, July 6, 1968, P 17 66 705.9

Int. Cl. G01s *5/14*

U.S. Cl. 343—112 **41 Claims**



A hyperbolic radio navigation system suitable for airborne surveys and having a pair of fixed transmitter stations and a mobile receiver station. Each station includes a frequency standard synchronized with and providing an output identical to the outputs of the other two standards. The system further includes improved transmitter circuitry for generating a preselected frequency which is the sum of coherent partial frequencies occupying the same broadcast band as the other transmitter output signal. An improved receiver is included for simultaneously detecting both transmitter signals, and for selecting one signal and suppressing the other. The receiver station further includes an improved goniometer.

3,750,189

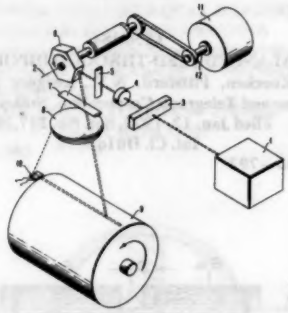
LIGHT SCANNING AND PRINTING SYSTEM

John M. Fleischer, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Oct. 18, 1971, Ser. No. 190,024

Int. Cl. G02b *17/00*; G01d *15/12*

U.S. Cl. 346—74 ES **21 Claims**



A light scanning system of controlled spot motion variation perpendicular to the direction of scan utilizing a rotating mirror and two cylindrical or toroidal lenses positioned relative to the rotating mirror to allow increased nominal axis of rotation to facet angular tolerances while maintaining a distinct non-overlapping line scan. Specifically, for one application the axis of rotation of the mirror is orthogonal to the plane formed by the incoming and reflected beam from the mirror. The first cylindrical or toroidal lens, which has little or no power in the

scan plane, focuses the incoming beam in the azimuth perpendicular to the scan onto the mirror while the second cylindrical lens acts as a beam configurer to configure the beam to substantially collimated shape while directing it towards a spherical lens for focusing onto an image plane.

3,750,190

ELECTROSTATIC RECORDING DEVICE UTILIZING THE ELECTRIC POTENTIAL IN A DISCHARGE SPACE

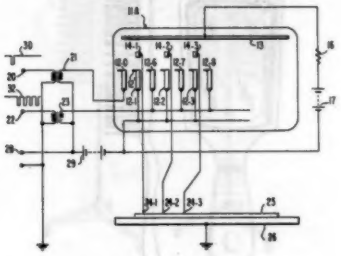
Toshio Ohkubo; Kazuo Ayaki, and Yoshizumi Terazawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Limited, Minato-ku, Tokyo, Japan

Filed Nov. 16, 1971, Ser. No. 199,225

Claims priority, application Japan, Nov. 20, 1970, 45/102881; Dec. 21, 1970, 45/116285

Int. Cl. G01d 15/06

U.S. Cl. 346—74 ES 21 Claims



The device comprises known means for making a gas discharge scan a plurality of scan electrodes. A plurality of voltage inducing electrodes are placed in the space which the discharge traverses. The electric potential assumes a certain definite distribution in the space between the firing one of the scan electrodes and the opposing electrode due to the electric conductivity produced in the space by the discharge. Means is provided for varying the space voltage in compliance with an electric signal. The voltage inducing electrodes are led out of the space to a row of styli, respectively. The voltage supplied successively to the styli is used to produce a record of the signal on an electrostatic recording medium which represents a high impedance against the induced voltage and which is fed transverse to the row of the styli.

3,750,191

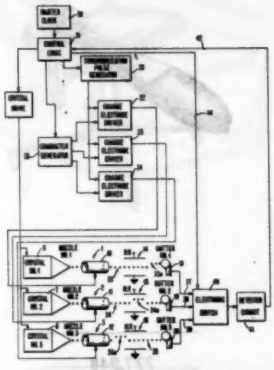
SYNCHRONIZATION OF MULTIPLE INK JETS

Hugh E. Naylor, III, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1972, Ser. No. 292,688

Int. Cl. G01d 15/18

U.S. Cl. 346—75 5 Claims



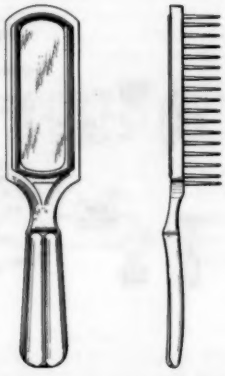
A method is described for sequentially determining if drop formation for each jet in an array of ink jets is occurring at the proper time.

DESIGNS

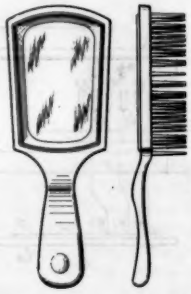
JULY 31, 1973

227,947
PULL TAB FOR A SLIDE FASTENER
Joseph W. Swenn, Meadville, Pa., assignor to Textron Inc.
Filed Feb. 7, 1972, Ser. No. 224,413
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

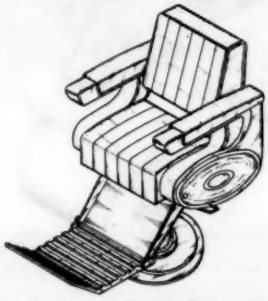
227,948
COMBINATION BRUSH AND COMB
Murry Abbott, North Providence, R.I., assignor to Cornell Manufacturing Co., Woonsocket, R.I.
Filed Nov. 15, 1971, Ser. No. 199,098
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—21



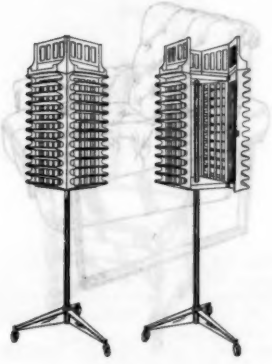
227,949
COMBINATION BRUSH AND COMB
Murry Abbott, North Providence, R.I., assignor to Cornell Manufacturing Co., Woonsocket, R.I.
Filed Nov. 15, 1971, Ser. No. 199,099
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—21



227,950
BARBER CHAIR
Masaharu Okiyama, 254 Kitahagusa, Higashiosaka, Osaka-fu, Japan
Filed Sept. 7, 1971, Ser. No. 178,545
Claims priority, application Japan Feb. 2, 1971
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—22



227,951
CIGARETTE MERCHANDISER
Robert B. Nielsen, Park Ridge, Ill., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.
Original design application Dec. 7, 1970, Ser. No. 26,342, now Patent No. 223,733. Divided and this application Dec. 17, 1971, Ser. No. 209,509
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—24

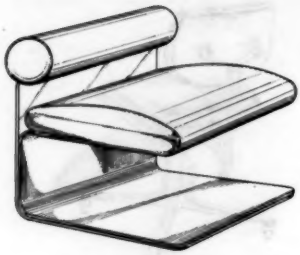


227,952
CHAIR
Eugene J. Costabile, Oak Lawn, Ill., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Feb. 3, 1972, Ser. No. 223,386
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—26

227,953
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,036
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—30

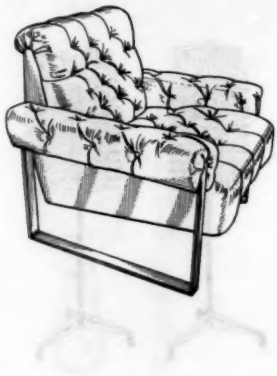
227,954
COMBINED CHAIR AND COLLAPSIBLE TRAY UNIT
Don Ray Gill, Hammond, Ind., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed June 23, 1971, Ser. No. 156,157
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—42

227,955
CHAIR
Roger K. Leib, 2123 Park Drive, Los Angeles, Calif. 90026
Filed Aug. 30, 1971, Ser. No. 176,427
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—47



227,956
CHAIR
Carl W. Sundberg and Montgomery Ferar, Southfield, and Chester J. Barecki, Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed Aug. 11, 1971, Ser. No. 171,028
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—66

227,957
CHAIR
Thomas Winrow, Naperville, Ill., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Apr. 22, 1971, Ser. No. 136,648
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69



227,958
CHAIR
Morris F. Fisher, 9820 Deerfield Circle, Carmel, Ind. 46032
Filed Apr. 27, 1971, Ser. No. 138,019
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69

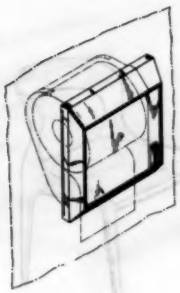
227,959
CHAIR
Richard M. Chapin, Charlotte, N.C., assignor to Dolly Madison Industries, Huntingburg, Ind.
Filed Jan. 7, 1972, Ser. No. 216,335
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

227,960
CHAIR
Kenji Ekuan, Tokyo, Japan, assignor to Minoru Ikeda, president of France Bed Co., Ltd., Tokyo, Japan
Filed Aug. 20, 1971, Ser. No. 173,729
Claims priority, application Japan Apr. 20, 1971
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—78

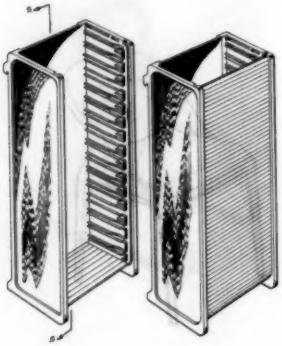
227,961
CHAIR
Kenji Ekuan, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Aug. 20, 1971, Ser. No. 173,728
Claims priority, application Japan Apr. 20, 1971
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—78

227,962
CHAIR
Kenji Ekuan, Tokyo, Japan, assignor to Minoru Ikeda, president of France Bed Co., Ltd., Tokyo, Japan
Filed Aug. 20, 1971, Ser. No. 173,727
Claims priority, application Japan Apr. 21, 1971
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—78

227,963
FRONT COVER FOR A BATHROOM TISSUE DISPENSER
Donald L. Pellow, P.O. Box 2209
Walnut Creek, Calif. 94595
Filed Sept. 28, 1971, Ser. No. 184,657
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97

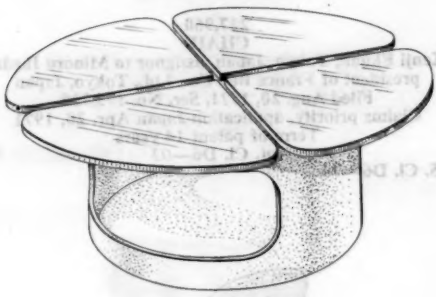


227,964
LOCKER
Robert L. Propst, 2347 Londonderry, Ann Arbor, Mich. 48104, and James O. Kelley, 203 Woodingham Court, Saline, Mich. 48176
Filed Oct. 26, 1970, Ser. No. 25,638
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150

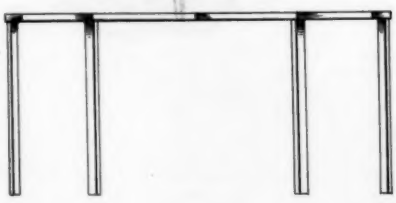


227,965
HANGING RACK
Grace F. Forshee, 516 San Vicente Blvd., Santa Monica, Calif. 90402
Filed Oct. 29, 1971, Ser. No. 194,085
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—113

227,966
COFFEE TABLE
Gordon L. Duern, 100 Queen St. N., Apt. 605, and Donald S. Griffin, 191 Filsinger Road, both of Kitchener, Ontario, Canada
Filed Apr. 7, 1971, Ser. No. 132,256
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

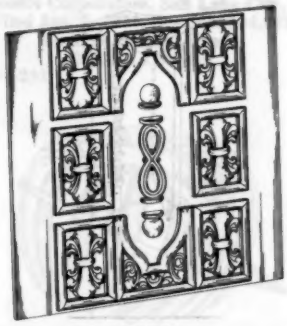


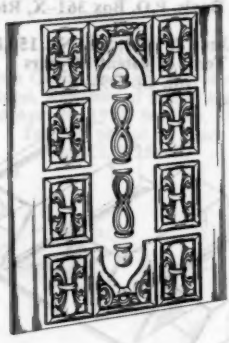
227,967
GAME TABLE
John Scarne, 4319 Meadowview Ave., North Bergen, N.J. 07047
Filed Sept. 20, 1971, Ser. No. 182,302
Term of patent 14 years
Int. Cl. D6—03
U.S. Cl. D6—177



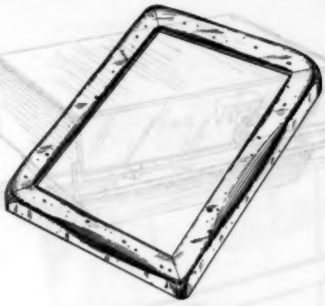
227,968
SELF-ACTUATING HOLDER FOR PHONOGRAPH RECORDS
Garry Kieves, 246 Rosalyn Road, Winnipeg 13, Manitoba, Canada
Filed July 30, 1971, Ser. No. 167,886
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

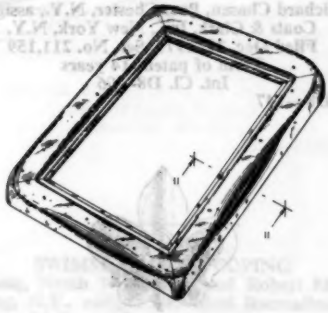
227,969
PANEL FOR FURNITURE
Richard M. Chapin, Charlotte, N.C., assignor to Dolly Madison Industries, Huntingburg, Ind.
Filed Jan. 7, 1972, Ser. No. 216,334
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



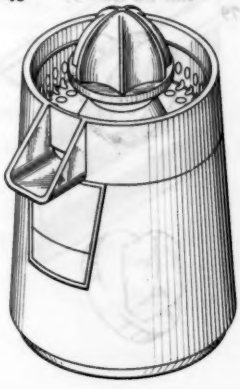


227,970
PICTURE FRAME
Gregor Davidoff, 325 Bleeker St., New York, N.Y. 10014
Filed Feb. 15, 1972, Ser. No. 226,644
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242

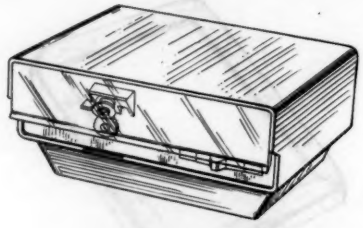




227,971
JUICE EXTRACTOR OR SIMILAR ARTICLE
Harold Weiss, Fort Lee, N.J., assignor to Van Wyck International Corporation, New York, N.Y.
Filed Apr. 5, 1971, Ser. No. 131,567
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—48



227,972
CAN OPENER
Alan F. Eckel, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed June 21, 1971, Ser. No. 155,390
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D8—36

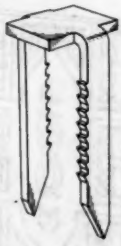


227,973
PULL
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 22, 1971, Ser. No. 211,159
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—147

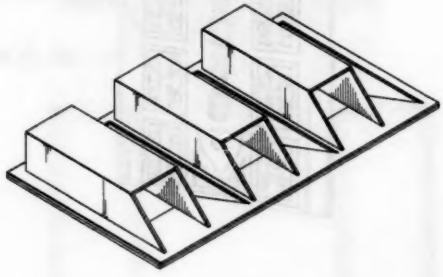
227,974
OUTLET PROTECTOR
Donald W. Brown, 218 E. Curling Drive, Boise, Idaho 83702
Filed Apr. 28, 1971, Ser. No. 138,403
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—179

227,975
EXPANDABLE REEL FOR RECEIVING WOUND FLEXIBLE MATERIAL
Murray Aaron Diamond, Ontario, Calif., assignor to Sentinel Container Corp., Pomona, Calif.
Filed Oct. 12, 1971, Ser. No. 188,645
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—220

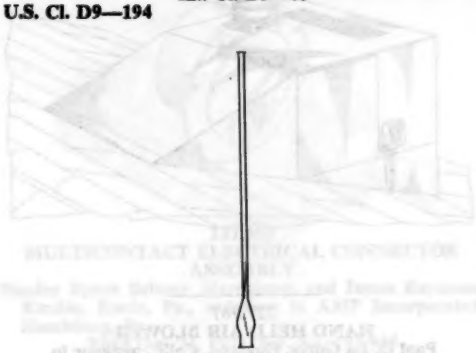
227,976
METAL PENETRATING STAPLE
Gerald D. Barth, Dundee, and Ralph E. Jennings, Glen Ellyn, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Feb. 4, 1972, Ser. No. 223,806
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—266



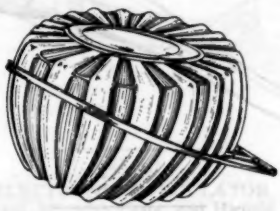
227,977
PROTECTOR FOR LOAVES OF BREAD
Robert M. Bish, 2112 Hackney, Houston, Tex. 77023, and Jewell W. Davis, P.O. Box 361–X, Rte. 2, Pearland, Tex. 77581
Filed June 7, 1971, Ser. No. 150,895
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184



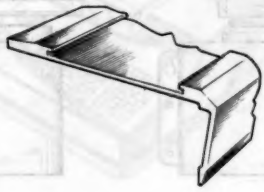
227,978
FORCING BAG
John MacManus, 143—16 22nd Road, Whitestone, N.Y. 11357
Filed Jan. 5, 1971, Ser. No. 104,195
Claims priority, application Great Britain July 9, 1970
The portion of the term of the patent subsequent to Sept. 7, 1985, has been disclaimed
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—194



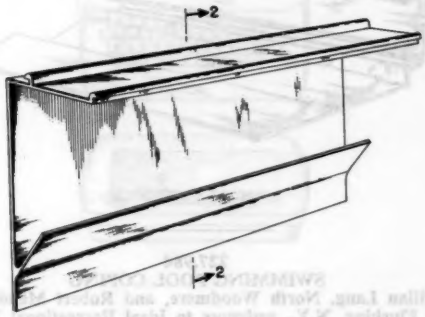
227,979
PACKAGING CONTAINER
Stanford W. Bird, Salt Lake City, Utah, assignor to Plastronics Corporation, Salt Lake City, Utah
Filed Jan. 7, 1971, Ser. No. 104,847
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231



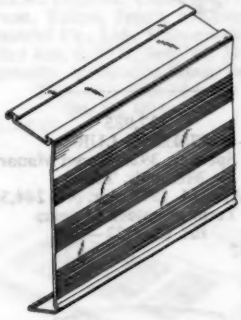
227,980
STAIRNOSING
Alfred Fenton Crosskill, 3 Hendon Road, Westville, Natal, Republic of South Africa
Filed Apr. 20, 1971, Ser. No. 135,817
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



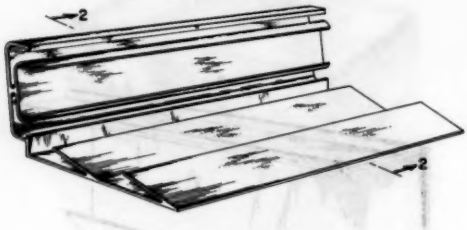
227,981
WINDOW JAMB OR SIMILAR ARTICLE
Joseph N. La Borde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Dec. 22, 1971, Ser. No. 211,149
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



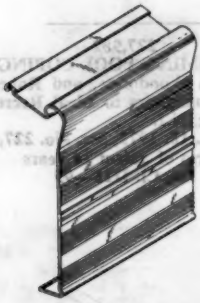
227,982
SWIMMING POOL COPING
Milan Lang, North Woodmere, and Robert Mendelow, Flushing, N.Y., assignors to Ideal Recreational Products, Inc., Stirling, N.J.
Filed Feb. 18, 1972, Ser. No. 227,712
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 G



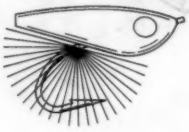
227,983
SNAP-ON CASING OR SIMILAR ARTICLE
Joseph N. La Borde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Dec. 22, 1971, Ser. No. 211,152
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



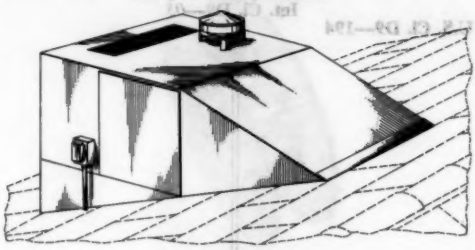
227,984
SWIMMING POOL COPING
Milan Lang, North Woodmere, and Robert Mendelow, Flushing, N.Y., assignors to Ideal Recreational Products, Inc., Stirling, N.J.
Filed Feb. 18, 1972, Ser. No. 227,711
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 G



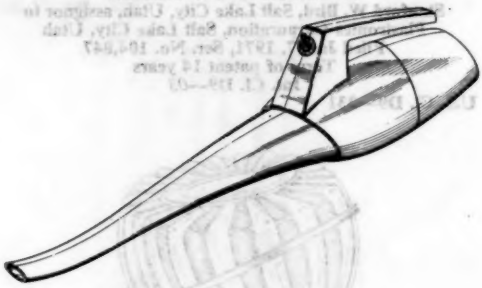
227,985
FISHING LURE
Robert G. Spencer, 3922 Karen Manor Lane, Memphis, Tenn.
Filed Apr. 14, 1972, Ser. No. 244,346
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



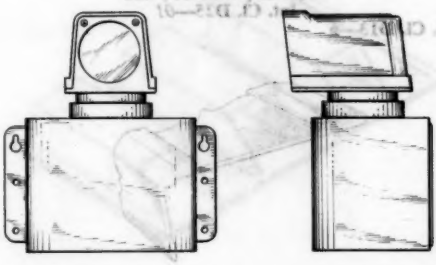
227,986
COMBINED REFRIGERATION UNIT AND AIR DUCT FOR DWELLINGS
Ezra Schaffer, 7309 E. Taylor, Scottsdale, Ariz. 85257
Filed May 5, 1971, Ser. No. 140,641
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



227,987
HAND HELD AIR BLOWER
Paul D. La Gorce, Oakland, Calif., assignor to Gordon G. Hughes, San Anselmo, Calif.
Filed Nov. 23, 1971, Ser. No. 201,606
Term of patent 14 years
Int. Cl. D23—*99*; D15—*05*
U.S. Cl. D23—162

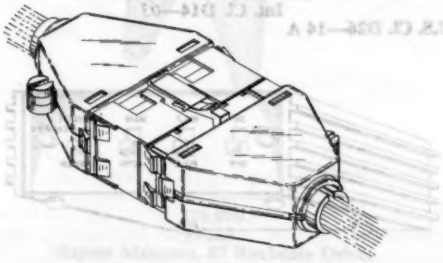


227,988
PHOTOELECTRIC DEVICE
Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Device Manufacturing Company, a division of Pittway Corporation, Syosset, N.Y.
Filed May 14, 1971, Ser. No. 143,746
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 F

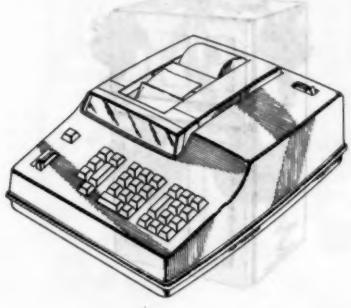


227,989
ELECTRIC CORD SOCKET
Dennis M. Geisel, 4203 Woodvale, South Bend, Ind. 46614
Filed June 30, 1971, Ser. No. 158,654
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

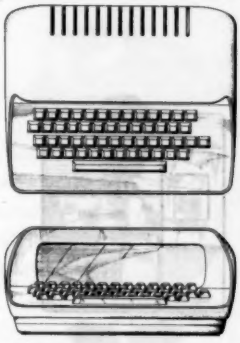
227,990
MULTICONTACT ELECTRICAL CONNECTOR ASSEMBLY
Stanley Byron Brinser, Harrisburg, and James Raymond Kunkle, Enola, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Oct. 22, 1971, Ser. No. 191,953
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

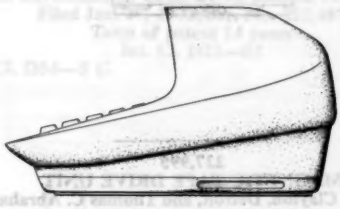


227,991
ELECTRONIC CALCULATOR
Kazuo Kumagai, Manatsu Ueda, and Hiroshi Takahashi, Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi-shi, Osaka, Japan
Filed Dec. 28, 1971, Ser. No. 213,236
Claims priority, application Japan June 28, 1971
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



227,992
TERMINAL
Robert J. Abbott, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Dec. 6, 1971, Ser. No. 205,473
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C





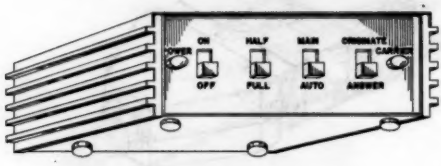
227,993
ELECTRONIC CALCULATOR
Teisuke Kurosu, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Jan. 6, 1972, Ser. No. 215,983
Claims priority, application Japan Sept. 17, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

227,994
INPUT TERMINAL
John Keenan, Northport, N.Y., assignor to Efkay Development Corporation, Huntington, N.Y.
Filed Dec. 29, 1971, Ser. No. 214,537
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

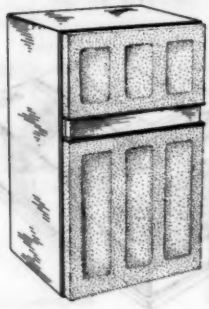
227,995
MAGNETIC TAPE DRIVE UNIT
Richard G. Clayton, Detroit, and Thomas C. Abrahamsen, Birmingham, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed June 19, 1972, Ser. No. 264,072
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

227,996
CONTROL PENDANT
Hans F. Schaefer, Jr., Rockport, and David W. France, West Newbury, Mass., assignors to USM Corporation, Flemington, N.J.
Filed May 30, 1972, Ser. No. 258,191
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C

227,997
DATA COUPLER
Joseph P. Marsalka, 4211 Woodbridge Road, Columbus, Ohio 43221
Filed May 12, 1971, Ser. No. 26,662
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



227,998
LOUDSPEAKER MODULE
Sidney Gibson, Toronto, Ontario, Canada, assignor to Noresco Manufacturing Co. Ltd., Toronto, Ontario, Canada
Filed Aug. 14, 1972, Ser. No. 280,591
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D26—14 G



227,999
BODY COMPONENT FOR AN ANIMAL TOY OR THE LIKE
Reuben B. Klamer, 9460 Wilshire Blvd., Beverly Hills, Calif. 90212, and Robert Y. Allen and Melvin Shaw, Los Angeles, Calif.; said Allen and said Shaw assignors to said Klamer
Application May 3, 1968, Ser. No. 11,762, which is a continuation of design application Ser. No. 7,790, July 13, 1967. Divided and this application Jan. 21, 1969, Ser. No. 16,471
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

228,000
DOLL
Mayme Mancuso, 87 Birchdale Drive, Scarsdale, N.Y. 10583
Filed Jan. 20, 1972, Ser. No. 219,606
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

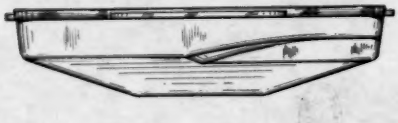
228,001
DOLL
Mayme Mancuso, 87 Birchdale Drive, Scarsdale, N.Y. 10583
Filed Jan. 20, 1972, Ser. No. 219,607
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

228,002
SEESAW
Neil H. Silverman, 13 Ursla Drive, Roslyn, N.Y. 11576
Filed Jan. 27, 1972, Ser. No. 221,487
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 C

228,003
GOLF PUTTER HEAD
Richard F. Warner, 28999 Gates Mills Blvd., Pepper Pike, Ohio 44124
Filed Feb. 7, 1972, Ser. No. 224,398
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

228,004
HAND EXERCISER
Frank J. Riccio, 1575 Iranistan Ave., Bridgeport, Conn. 06604, and Leonard Napoli, 60 Rosebrook Drive, Stratford, Conn. 06497
Filed Mar. 3, 1972, Ser. No. 231,772
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

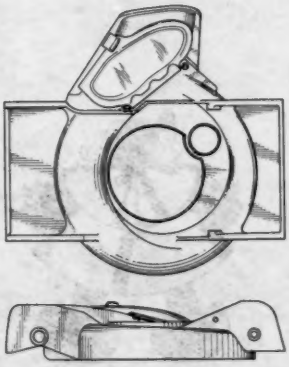
228,005
MAZE PUZZLE
Albert Stubbmann, Franklin Lakes, N.J., assignor to General Foods Corporation, White Plains, N.Y.
Filed July 2, 1971, Ser. No. 159,588
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



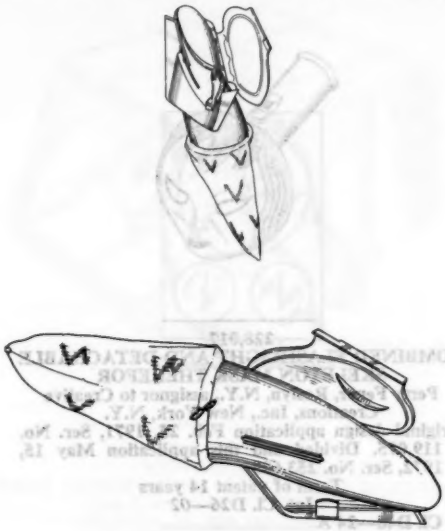
228,006
PUZZLE BOARD
Judy A. Cohen, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc.
Filed Aug. 20, 1971, Ser. No. 173,720
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

228,007
SEGMENTED FLOWER GUARD
Helen H. Fletcher, Rte. 7, Box 525W, San Antonio, Tex. 78221
Filed Dec. 29, 1971, Ser. No. 213,788
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 C

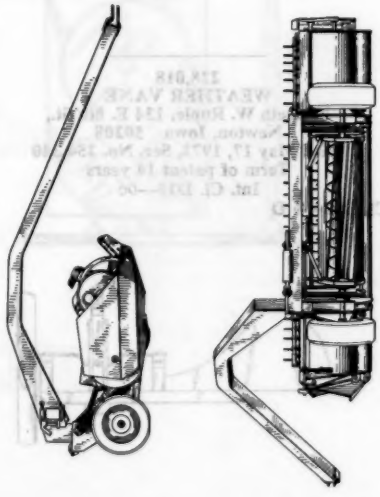
228,008
COMBINED ROTARY MOWER HOUSING AND DISCHARGE DEFLECTOR
Richard A. Thorud, Minneapolis, Minn., assignor to Toro Manufacturing Corporation, South Minneapolis, Minn.
Filed Jan. 14, 1971, Ser. No. 106,617
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B



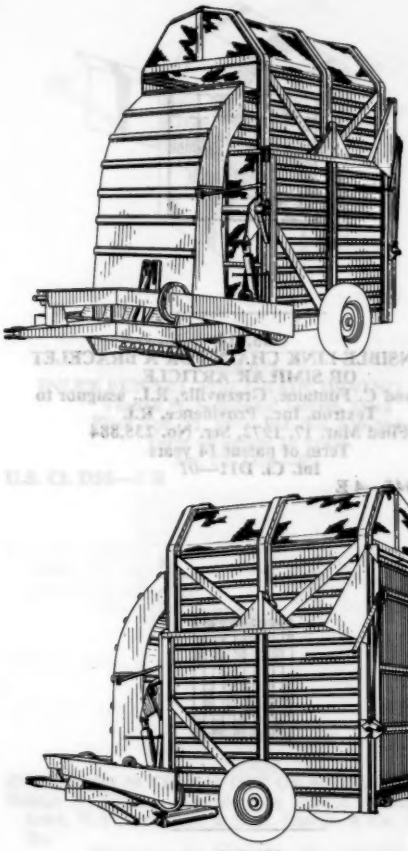
228,009
COMBINATION DISCHARGE DEFLECTOR, BAG CHUTE AND BAG FOR MOWERS AND THE LIKE
Richard A. Thorud, Minneapolis, Minn., assignor to Toro Manufacturing Corporation, South Minneapolis, Minn.
Filed Jan. 14, 1971, Ser. No. 106,623
Term of patent 14 years
Int. Cl. D15—*03, 99*
U.S. Cl. D40—1 B



228,010
COMBINED MOWER, CONDITIONER AND WINDROWER
Merle K. Burkhart, Ferol S. Fell, and Cecil L. Case, Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed Sept. 9, 1971, Ser. No. 179,249
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



228,011
MACHINE FOR LOADING AND STACKING CROPS
Allen A. White, Peabody, Harold Keith Garrison, Newton, and Gary Weddle, Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed May 3, 1971, Ser. No. 139,991
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



228,012
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.
Filed July 3, 1972, Ser. No. 268,550
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

228,013
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.
Filed July 3, 1972, Ser. No. 268,723
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

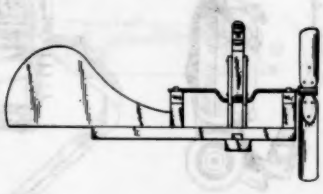
228,014
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.
Filed Mar. 17, 1972, Ser. No. 235,884
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

228,015
PENDANT
Ade Bethune, Newport, R.I., assignor to Terra-Sancta Creations, Inc., Philadelphia, Pa.
Original design application Nov. 13, 1970, Ser. No. 25,962, now Patent No. 224,599. Divided and this application Dec. 30, 1971, Ser. No. 214,507
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 A

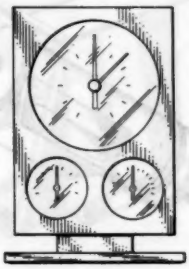
228,016
COMBINED FLASHLIGHT AND DETACHABLE WITCH MASK THEREFOR
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Original design application Feb. 25, 1971, Ser. No. 119,075. Divided and this application May 15, 1972, Ser. No. 253,701
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

228,017
COMBINED FLASHLIGHT AND DETACHABLE SKELETON MASK THEREFOR
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Original design application Feb. 25, 1971, Ser. No. 119,075. Divided and this application May 15, 1972, Ser. No. 253,698
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

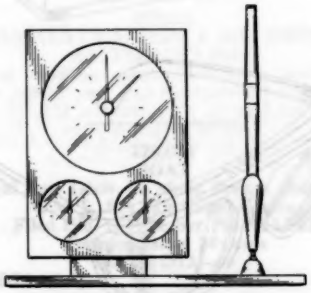
228,018
WEATHER VANE
Kenneth W. Ruple, 134 E. 8th St., Newton, Iowa 50208
Filed May 17, 1972, Ser. No. 254,340
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D52—6 D



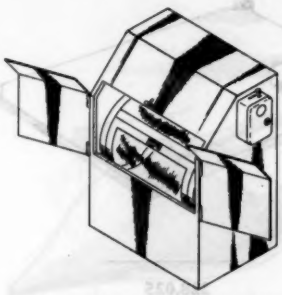
228,019
COMBINED BAROMETER, THERMOMETER, AND HYGROMETER
John Cuccio, Westport, Conn., assignor to Sybron Corporation, Rochester, N.Y.
Filed Nov. 15, 1971, Ser. No. 199,077
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7 R



228,020
COMBINED WEATHER INSTRUMENT AND DESK SET
John Cuccio, Westport, Conn., assignor to Sybron Corporation, Rochester, N.Y.
Filed Nov. 15, 1971, Ser. No. 199,097
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7 R

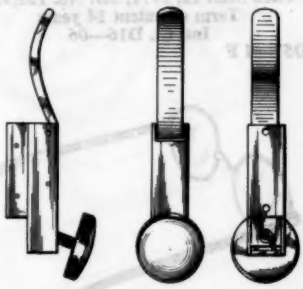


228,021
FISH SCALER
Lloyd G. Burns, 1461 Camille St., Shreveport, La. 71108
Filed Jan. 18, 1971, Ser. No. 107,602
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1 E

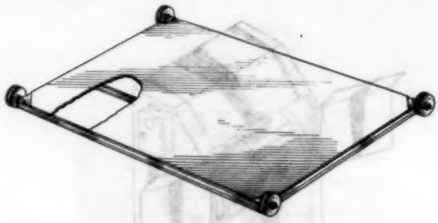


228,022
INLET FUNNEL FOR GRAIN DRYING BINS
Vernon H. Sietmann, Laurel, Iowa
Filed Apr. 21, 1971, Ser. No. 136,304
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 H

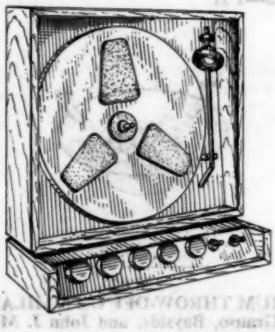
228,023
SNARE DRUM THROW-OFF OR SIMILAR ARTICLE
Robert N. Grauso, Bayside, and John J. Morena, Levittown, N.Y., assignors to C. F. Martin & Co., Nazareth, Pa.
Filed Apr. 30, 1971, Ser. No. 139,308
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E



228,024
POULTRY HOUSING SERVICE VEHICLE
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed July 6, 1971, Ser. No. 160,244
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D55—1 C



228,025
VERTICAL RECORD PLAYER OR SIMILAR ARTICLE
Byron E. Askin, St. Joseph, Mich., assignor to V-M Corporation, Benton Harbor, Mich.
Filed June 9, 1971, Ser. No. 151,620
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

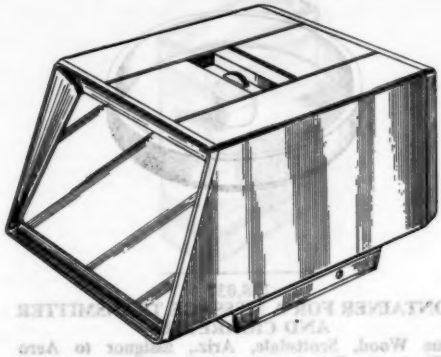


228,026
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 12, 1971, Ser. No. 123,935
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

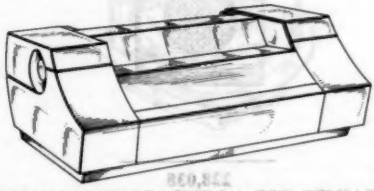
228,027
NIGHT VIEWING DEVICE
Donald T. Heckel, San Jose, William R. Hill, Campbell, and Robert H. Pfeiffer, Ben Lomond, Calif., assignors to GTE Sylvania Incorporated
Filed Apr. 22, 1971, Ser. No. 136,630
Term of patent 3½ years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

228,028
PAIR OF SUNGLASSES
Conrad Leblanc, Leominster, and Vitalino Marchi, Concord, Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.
Filed July 15, 1971, Ser. No. 163,142
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 D

228,029
REAR PROJECTION VIEWER
James M. Conner, Mamaroneck, N.Y., and Henry J. Salvador, Hasbrouck Heights, N.J., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Aug. 24, 1971, Ser. No. 174,580
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 N

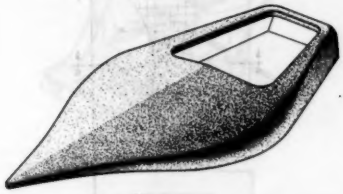


228,030
PRINTER HOUSING
Robert Howard, Roslyn, N.Y., assignor to Centronics Data Computer Corp., Hudson, N.H.
Filed July 19, 1971, Ser. No. 164,186
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 B



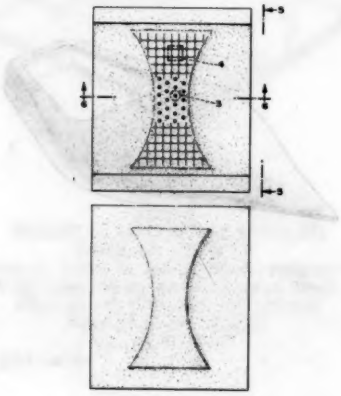
228,031
BOAT
Marcel Jean Tabur, Le Mans, France, assignor to G.M.T., S.A., Le Mans, France
Filed Feb. 1, 1971, Ser. No. 111,782
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q

228,032
BOAT HULL
William Wolfson, 1342 Oakwood Drive, Arcadia, Calif. 91006
Filed May 12, 1971, Ser. No. 142,859
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q

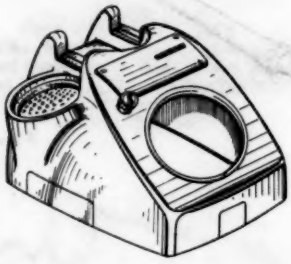


228,033
DESK PEN
Roy M. Jenkins, deceased, by Henry Fleischer, administrator, Los Angeles, Calif., assignor to Lindy Pen Company, Incorporated
Filed Jan. 10, 1972, Ser. No. 216,874
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

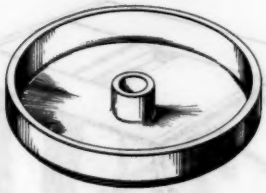
228,034
DISPOSABLE DIAPERS
Evelyn H. Krusko, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.
Filed Aug. 2, 1971, Ser. No. 168,529
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A



228,035
TELEPHONE STERILIZER
George Robert Cobb, P.O. Box 217, New Westminster, British Columbia, Canada
Filed Dec. 17, 1971, Ser. No. 209,492
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 W

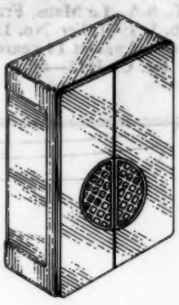


228,036
COMBINED CIGARETTE SNUFFER AND ASH-TRAY LINER OR SIMILAR ARTICLE
Harry W. Hollister, 89 Thayer St., New York, N.Y. 10040
Filed May 10, 1971, Ser. No. 142,106
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2 H

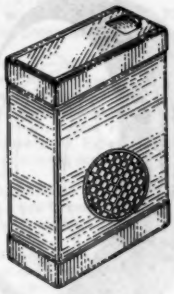


228,037
CONTAINER FOR A MESSAGE TRANSMITTER AND CIGARETTES
June Wood, Scottsdale, Ariz., assignor to Aero Electronics Development Co., Inc., Tempe, Ariz.
Filed June 21, 1971, Ser. No. 155,370
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D85—2 B

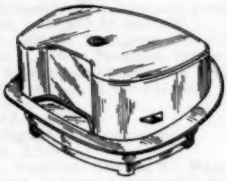
228,038
CONTAINER FOR A MESSAGE TRANSMITTER AND CIGARETTES
June Wood, Scottsdale, Ariz., assignor to Aero Electronics Development Co., Inc., Tempe, Ariz.
Filed June 21, 1971, Ser. No. 155,375
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D85—2 B



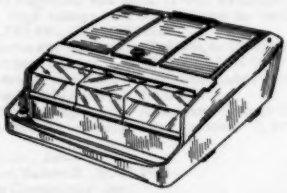
228,039
CONTAINER FOR A MESSAGE TRANSMITTER AND CIGARETTES
June Wood, Scottsdale, Ariz., assignor to Aero Electronics Development Co., Inc., Tempe, Ariz.
Filed June 21, 1971, Ser. No. 155,376
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D85—2 B



228,040
PORTABLE HAIR CURLER APPLIANCE CASING
Martin J. Wolff, 116 Elizabeth St., Apt. 3A, West Haven, Conn. 06516
Filed Dec. 23, 1971, Ser. No. 211,817
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

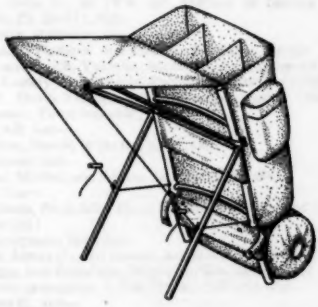


228,041
PORTABLE HAIR CURLER APPLIANCE CASING
Jacob A. Krapowicz, Neds Mountain Road, Ridgefield, Conn. 06877
Filed Dec. 23, 1971, Ser. No. 211,818
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

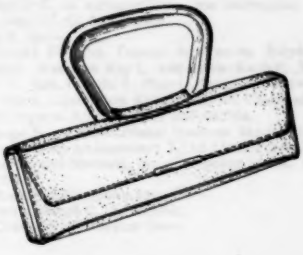


228,042
EYE MIRROR
Louis D. Abramson, Milton, Mass., assignor to Life-Time Companies, Inc., Boston, Mass.
Filed Apr. 20, 1972, Ser. No. 246,121
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 H

228,043
COMBINED BACKPACK AND FOLDABLE CARRYING FRAME
Conrad B. Sloop, 9092 Bermuda Drive, Huntington Beach, Calif. 92646
Filed Sept. 7, 1971, Ser. No. 178,542
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



228,044
CARRYING CASE FOR AN UMBRELLA
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Filed Apr. 28, 1972, Ser. No. 248,784
Term of patent 7 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



228,045
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 3, 1971, Ser. No. 209,511
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R

228,046
TIRE
Philip S. Hammond, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 2, 1972, Ser. No. 223,063
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Deolorme, John H., 3,749,488.

Abbott, John A.; and Watson, Clyde D., to FMC Corporation. Apparatus for continuous preparation of tobacco. 3,749,103, Cl. 131-136.000.

Abbott Laboratories: *See—*
Stein, Robert George; and Nordeen, Carl William, 3,749,715.

Abe, Jinnosuke; Miyauchi, Kango; and Kanoh, Masatoshi, to Toyo Jozo Kabushiki Kaisha. Animal feed supply. 3,749,580, Cl. 99-9.000.

Abendroth, Paul; Alix, Hans; Preuss, Friedrich; and Kunkel, Fred, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Damping device for lithographic printing presses. 3,749,011, Cl. 101-148.000.

Abex Corporation: *See—*
Blanyer, Carl G., 3,750,019.

Abildgaard, William H.; and Groswith, Charles T., III, to Velco-Bind, Inc. Pressure sensitive end sheet for casing books. 3,749,422, Cl. 281-21.000.

Abildgaard, William H.; and Groswith, Charles T., III, to Velco-Bind, Inc. Pressure sensitive end sheets for uncased books and method and apparatus for casing books. 3,749,423, Cl. 281-21.000.

Abitibi St. Anne Paper Ltd.: *See—*
Hamilton, Douglas D., 3,749,143.

Abnett, Albert C.; and Boley, Robert A., to Reliance Electric Company. Vibration analyzer probe with reduced temperature sensitivity. 3,750,010, Cl. 324-34.

Abruzzi, Pierluigi: *See—*
Vargiu, Silvio; Passalenti, Beppino; and Abruzzi, Pierluigi, 3,749,689.

ACF Industries, Incorporated: *See—*
Fowler, James M., 3,749,357.

Ackerman, Philip W.: *See—*
Cohen, Peter J.; and Ackerman, Philip W., 3,749,841.

Acoustic Fiber Sound Systems, Inc.: *See—*
Everitt, Scott F.; Croup, Robert E.; and Strawn, Alvin A., 3,749,198.

Acurex Corporation: *See—*
Husome, Robert G., 3,749,923.
Kennedy, William S., 3,749,225.

Adachi, Takeshi. Orchestral effect producing system for an electronic musical instrument. 3,749,807, Cl. 84-1.170.

Addison, Frank E., 40% to Montgomery, James Boring, 10% to Plaisance, Anatale J., 10% to Franaques, Howard L., Jr. and 5% to Arabie, Joseph, Jr. Method and apparatus for automatically controlling fluid flow. 3,749,126, Cl. 137-613.000.

Addmaster Corporation: *See—*
Busch, Richard E., 3,749,221.

Addressograph-Multigraph Corporation: *See—*
Lake, Francis K., 3,749,012.

Adickes, Cecil F.; Beaubien, Thomas S.; Weir, George R.; and Echterling, Eugene J., to Innova Incorporated. Bean bag with handle and a stabilizing vane. 3,749,402, Cl. 273-106.00r.

Adler, Ralph W.; Goldstein, Albert; and Haase, Robert, to American Chain & Cable Company Inc. Subfloor conveyor systems. 3,749,027, Cl. 104-172.0bt.

Adrian, Adolf: *See—*
De Baan, Johannes Jasper; and Adrian, Adolf, 3,749,210.

Affleck, Lyle Claud. Safety closure for a container. 3,749,270, Cl. 215-9.000.

Agence Nationale de Valorisation de la Recherche: *See—*
de Bennetot, Michel Cotton, 3,749,098.

Agfa-Gevaert N.V.: *See—*
De Haes, Louis Maria, 3,749,912.
Meeussen, Louis Achilles, 3,749,922.
Pollet, Robert Joseph; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,749,574.
Staes, Karel Germanus; and Natens, Luc Yves, 3,748,981.

Agrawal, Govind M.: *See—*
Laverman, Royce Jay; and Agrawal, Govind M., 3,748,865.

Ahrens, Paul Raymond; and Bean, Jerome Benjamin, Jr., to RCA Corporation. High voltage hold down circuit for horizontal deflection circuit. 3,749,966, Cl. 315-27.0td.

Aihara, Wataru; and Kawamoto, Takashi, to Shimadgu Seisakusho Ltd. Electronic yarn cleaner. 3,748,707, Cl. 38-64.000.

Aileo, Jackson A., to Sentex Corporation. Safety helmet with retractable eye shield. 3,748,657, Cl. 2-6.000.

Ailman, David Edgar, to American Cyanamid Company. 4-(Dichloromethyl) cinnoline and process. 3,749,718, Cl. 260-250.00a.

Air Factors, Inc.: *See—*
Lambert, Robert R., 3,748,998.

Air Monitor Corporation: *See—*
De Baun, Kenneth W., 3,748,901.

Air Preheater Company, Inc., The: *See—*
Bakker, Lubertus; and Krumm, Eugene D., 3,749,029.

Airco, Inc.: *See—*
Gregory, Eric; Marancik, William G.; and Shattes, Walter J., 3,749,547.
Lofredo, Anthony; and Goldschmidt, David H., 3,748,864.
Terrell, Ross C.; and Moore, George L., 3,749,791.
Terrell, Ross C.; and Moore, George L., 3,749,793.
Terrell, Ross C.; and Moore, George L., 3,749,794.
Terrell, Ross C., 3,749,798.

Airpax Electronics Incorporated: *See—*
Harper, George S.; and Shand, John Richard, 3,749,873.

Airtrol Corporation: *See—*
Anderson, Gordon R., Jr., 3,749,954.

Aisin Seiki Kabushiki Kaisha: *See—*
Nakane, Kazushige; Honmi, Tadashi; and Koike, Katsumi, 3,748,873.

Akima, Akira: *See—*
Nishikawa, Masao; and Akima, Akira, 3,749,112.

Aktiebolaget Svenska Flaklfabriker: *See—*
Lagerdahl, Sebastian; Mascord, Kenneth; and Maartmann, Sten, 3,748,831.

Aktiebolaget Svenska Flaktfabriken: *See—*
Widerby, Lennart; and Svensson, Stig, 3,748,803.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Beriger, Conrad, 3,749,983.
Kalt, Ulrich; and Kung, Rolf, 3,749,865.

Akuwa, Fumio: *See—*
Kinjo, Hisao; and Akuwa, Fumio, 3,749,827.

AKZO Belge S.A.: *See—*
Lefebvre, Simon, 3,748,828.

Albright, Richard W. Duplex visor. 3,748,658, Cl. 2-10.000.

Alexander, Carl J., to Wells Manufacturing Corporation. Support means for reciprocating saw blade. 3,748,738, Cl. 30-394.000.

Alexander, John A., to TRW Inc. Method of making composites. 3,748,721, Cl. 29-471.300.

Alexandrovich, Valentin: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Alfa-Laval AB: *See—*
Thylefors, Henric Wilhelm, 3,749,458.

Alison, Jacques: *See—*
Nicolas, Michel; and Alison, Jacques, 3,749,562.

Alix, Hans: *See—*
Abendroth, Paul; Alix, Hans; Preuss, Friedrich; and Kunkel, Fred, 3,749,011.

All-Steel Equipment Inc.: *See—*
Powell, James C.; and Treber, Andrew S., 3,748,674.

Allais, Andre; and Peterfalvi, Michel, to Roussel-UCLAF. Certain barbituric acid derivatives. 3,749,723, Cl. 260-256.40c.

Allen, James R.: *See—*
Karchak, Andre W., Jr.; and Allen, James R., 3,749,192.

Allen, Robert N.: *See—*
Glass, Marvin I.; Morrison, Howard J.; Nix, Donald F.; and Allen, Robert N., 3,748,780.

Allen-Bradley Company: *See—*
Crepeau, Robert G., 3,749,860.

Allergan Pharmaceuticals, Inc.: *See—*
Eakins, Kenneth E., 3,749,776.

Allis-Chalmers Corporation: *See—*
Meyer, Theodore R.; and Boyajian, Myron J., 3,749,207.
Rockwell, Harvey W., 3,749,182.

Allmand Bros., Inc.: *See—*
Allmand, Walter C., 3,749,907.

Allmand, Walter C., to Allmand Bros., Inc. Bulbholder mounting assembly. 3,749,907, Cl. 240-52.00r.

Alm, Donald S.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.

Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., to Vic Chemicals, Inc. Vapor injector for engines. 3,749,376, Cl. 261-18.00a.

Almasi, George S., to International Business Machines Corporation. Bubble domain chip arrangement. 3,750,154, Cl. 340-174.0tf.

Alms, Erhard E.; and Mitchell, James E. Space heater. 3,749,551, Cl. 432-222.000.

Altec Manufacturing Company, Inc.: *See—*
Castleberry, Joseph C., 3,748,860.

Aluminum Company of America: *See—*

Smith, George L., Jr.; and Diekhoff, Hans H., 3,749,275.
Alver, Alf S.; and Pilpel, Walter, to United Aircraft Corporation. Composite blade root configuration. 3,749,518, Cl. 416-230.000.
Amador, German, to Dresser Industries, Inc. Governor for pneumatic motor. 3,749,530, Cl. 418-41.000.
Amdur, Elias J., to Honeywell Inc. Dry torque motor servo valve. 3,749,129, Cl. 137-625.620.
American Bank Note Company: *See—*
Gazzola, Ivaldo; D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,749,330.
American Chain & Cable Company Inc.: *See—*
Adler, Ralph W.; Goldstein, Albert; and Haase, Robert, 3,749,027.
American Coolair Machines: *See—*
Jones, Emery Benjamin, 3,749,992.
American Cyanamid Company: *See—*
Ailman, David Edgar, 3,749,718.
Hewitt, Redginal Irving, 3,749,780.
Maulding, Donald Roy, 3,749,677.
Montgomery, William Herbert, 3,749,620.
Rauhui, Michael McKay, 3,749,679.
Thomas, Daniel Walter; and Giambalvo, Vito Albert, 3,749,590.
American Home Products Corporation: *See—*
Freed, Meier E.; and Childress, Scott J., 3,749,725.
Schneller, George H.; Levin, Howard J.; and Sklar, Stanley, 3,749,779.
Strike, Donald P.; and Smith, Herchel, 3,749,741.
Wli, Peter H. L., 3,749,750.
American Optical Corporation: *See—*
Bosack, Irwin A.; and Sussman, Milton H., 3,749,481.
American Standard Inc.: *See—*
Tompkins, Melvin W.; and Retz, George F., 3,748,793.
Amerock Corporation: *See—*
Newcomer, John I., 3,749,465.
Ammann, Robert W., to GTE Automatic El Laboratories Incorporated. Constant current pull-up circuit f OS memory driver. 3,749,945, Cl. 307-253.000.
Amoco Production Company: *See—*
Montgomery, Neal R., 3,749,762.
AMP Incorporated: *See—*
Crowley, Daniel Joseph, 3,749,888.
Gardner, Mervin Amos, 3,750,084.
Neiman, Richard Alvin; and Schwalm, Glendon Henry, 3,748,932.
Tiazkun, Michael George; and Loose, Winfield Warren, 3,749,866.
Anantha, Narasipur Gundappa, to International Business Machines Corporation. Semiconductor device embodying field effect transistors and Schottky barrier diodes. 3,749,987, Cl. 317-235.00r.
Anastassakis, Evangelos M. Weight sensitive security system. 3,750,158, Cl. 340-272.000.
Andeen, Edmond C. Ice roll flarer. 3,749,184, Cl. 175-18.000.
Andelfinger, George F.; and Kuhajek, Eugene J., to Morton-Norwich Products, Inc., mesne. Iodine source for animal feeding in salt block form. 3,749,579, Cl. 99-2.0cd.
Anders, Edward O., to Global Marine Inc., mesne. Arctic oil and gas development. 3,749,162, Cl. 166-.500.
Anderson, Gordon R., Jr., to Airtrol Corporation. Bearing cap for electric motor. 3,749,954, Cl. 310-90.000.
Anderson, Malcolm W., to United States Pipe and Foundry Company. Apparatus for producing anchor bolts. 3,748,673, Cl. 10-11.00r.
Anderson, Tore N. Marine radar with T-V receiver display. 3,750,164, Cl. 343-5.00r.
Ando, Noriyoshi: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; and Ando, Noriyoshi, 3,749,070.
Andres, Rudolf, to Daimler-Benz Aktiengesellschaft. Installation for the venting of a fuel tank of a vehicle. 3,749,124, Cl. 137-587.000.
Andrews, Harry E., to Production Tube Company, Inc. Push rod structure. 3,749,068, Cl. 123-90.610.
Andrews, James E., to Motorola, Inc. Priority channel scanning system with dual response time control. 3,750,032, Cl. 325-770.000.
Andrews, Ray L.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.
Andrews, William P.; and Beuth, Jack L., to Reynolds Metals Company. Method of making a decorative lamination. 3,749,629, Cl. 156-276.000.
Andrzejak, Sigmund L.; and Berg, Raymond B., to United States Steel Corporation. Method and device for shrouding a stream of metal teemed through a slidable gate. 3,749,387, Cl. 266-38.000.
Anger, Hal O., to United States of America, Atomic Energy Commission. Multiple lens camera for obtaining time sequential images. 3,748,992, Cl. 95-36.000.
Anglo-Transvaal Consolidated Investment Company Limited: *See—*
Taylor, Richard Francis, 3,749,448.
Angstrohm-Precision Incorporated: *See—*
Schumer, Henry A., 3,749,347.
Angus, Charles D.; and Angus, John C., to Angus Research Corporation. Constant depth trolling device. 3,749,045, Cl. 114-235.00b.
Angus, David R.; and Smith-Vaniz, William Reid, to General Computing Equipment Corporation. Electronic system employing plural processing stations for issuing airline boarding passes while effecting seat assignments, and generally for parcelling elements o an ordered set. 3,750,103, Cl. 340-153.200.
Angus, John C.: *See—*
Angus, Charles D.; and Angus, John C., 3,749,045.
Angus Research Corporation: *See—*
Angus, Charles D.; and Angus, John C., 3,749,045.
Anritsu Electric Company, Ltd.: *See—*
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kaisoka, Toshimitsu, 3,749,220.
Ansel, Robert E.: *See—*
Gaske, Joseph E.; and Ansel, Robert E., 3,749,592.
Anselmino, Giovanni: *See—*
Peruglia, Marco; and Anselmino, Giovanni, 3,749,125.
APL Corporation: *See—*
Verbeke, Henry, 3,749,218.
Appelaniz, Joseph E., to Power Chemco Inc. Light-sensitive mixed esters of polyvinylolcoid. 3,749,699, Cl. 260-79.30r.
Aqua Systems and Products of Michigan, Inc., mesne: *See—*
Heaton, A. H., 3,749,165.
Arabie, Joseph, Jr.: *See—*
Addison, Frank E., 3,749,126.
Arai, Hiroshi: *See—*
Uozumi, Sumio; and Arai, Hiroshi, 3,748,856.
Arimura, Ichiro, to Matsushita Electric Industrial Co., Ltd. Color television signal reproducing system. 3,749,826, Cl. 178-5.4cd.
Arimura, Ichiro; Taniguchi, Hiroshi; and Tanaka, Hiromichi, to Matsushita Electric Industrial Co., Ltd. Continuous signal producing system. 3,749,835, Cl. 178-69.5cb.
Armco Steel Corporation: *See—*
Cornelsen, David J., 3,749,529.
Armstrong, James J., to Texas Instruments, Incorporated. Apparatus for providing controlled temperature ambient. 3,749,879, Cl. 219-210.000.
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., to General Electric Company. Gun barrel system. 3,748,957, Cl. 89-16.000.
Aro, Erkki, to Kone Osakeyhtio. Device for distributing wood to the feed chutes of shredders. 3,749,326, Cl. 241-136.000.
Aronberb, Lester; and Lytton, Donald B., to Lake Chemical Company. Fill-in compositions containing an organic resinous film-forming material, an organic solvent, and a waxy material. 3,749,687, Cl. 260-23.0tn.
Artin, Robert Lee; and Petroske, Robert Paul, to Oster, John, Manufacturing Co. Hair clipper having blade illumination and field wire strain relief. 3,749,951, Cl. 310-73.000.
Asahi Glass Company, Ltd.: *See—*
Nagasima, Takeomi, 3,749,885.
Asano, Hiroshi; Kikuchi, Makoto; Takeuchi, Hideo; and Kondo, Michimasa, to Mitsubishi Denki Kabushiki Kaisha. Optical pumping magnetometer. 3,750,008, Cl. 324-.50r.
Asberg, Sturl, to SKF Industrial Trading and Development Company N.V. Wheel support for an engine propelled road vehicle. 3,749,416, Cl. 280-96.100.
ASC Industries, Inc.: *See—*
Stansbury, Patrick H., 3,749,543.
Ashen, Ronald H. K.; and Carpenter, Richard L. Apparatus and method to facilitate shopping. 3,749,191, Cl. 177-1.000.
Ashizawa, Yoshimi; and Kitagima, Isao, to Toshiba Kikai Kabushiki Kaisha. Spinning lathe. 3,748,883, Cl. 72-81.000.
Asmus, Richard W. Method of sealing a container. 3,748,816, Cl. 53-15.000.
Asplund, Robert W., to GTE Sylvania Incorporated. Electronic ignition timing system for internal combustion engines. 3,749,073, Cl. 123-148.00e.
Atkins, Barry Keith, to Waso Limited. Lock assemblies particularly suitable for motor vehicles. 3,748,880, Cl. 70-248.000.
Atkinson, Donald C. Clip means for holding inserts in molds. 3,749,350, Cl. 249-106.000.
Atlas Chemical Industries, Inc.: *See—*
Spillane, Matthew L., 3,748,893.
Atomic Fire Equipment Company: *See—*
Bower, James C., 3,749,175.
Augustine, Lewis Edwin, to Titanium Processors Incorporated. Surface preparation of titanium and titanium alloys for bonding materials thereto. 3,749,613, Cl. 148-6.210.
Auriol, Alain: *See—*
Foucry, Jean; and Auriol, Alain, 3,749,595.
Austin, Charles W.; and Melton, Francis W. Artificial guiding feather for arrows. 3,749,403, Cl. 273-106.50c.
Automated Copier Systems, Inc. 55 Toner container and holder for electrostatic copiers: *See—*
Sanders, Isaac W., 3,749,287.
Automatic Switch Co., mesne: *See—*
Beeken, Basil B.; and Ignatjev, Vladimir, 3,749,127.
Automobiles Peugeot: *See—*
Rouvre, Philippe; and Peroy, Francois, 3,750,080.
Autoquip Corporation: *See—*
Clarke, Jesse E., 3,749,201.
Avco Corporation: *See—*
Douglas-Hamilton, Diarmaid H.; and Pugh, Evan R., 3,749,967.
Wreghitt, Kenneth W.; Pusfy, Peter Shirley; and Munro, Donald Gilbert, 3,749,273.
Avdeef, Robert A. Analog to digital conversion and computation method. 3,749,894, Cl. 235-150.520.
Avedissian, Michael K., to Weste2 Electric Company, Incorporated. Vibration isolator mount. 3,749,339, Cl. 248-20.000.
Avis, John M., to Koehring Company. Side delivery broom. 3,748,839, Cl. 56-328.00r.

Ayaki, Kazuo: *See—*
Ohkubo, Toshio; Ayaki, Kazuo; and Terazawa, Yoshizumi, 3,750,190.

Ayers, Weston D.; and Hirsch, Joseph G., to General Dynamics Corporation. Method and means for sensing strain with a piezoelectric strain sensing element. 3,750,127, Cl. 340-261.000.

Azadian, Genevieve, nee Boulanger: *See—*
Geiger, Rolf; Wissmann, Hans; Konig, Wolfgang; and Azadian, Genevieve, nee Boulanger, 3,749,706.

Baars, Nicolaas Joris, to U.S. Philips Corporation. Television receiver. 3,750,029, Cl. 325-420.000.

Baba, Takeshi; Shibuya, Kenji; Sasada, Masaaki; Nakagawa, Mikio; and Nagao, Taichiro. Radio communication transmission system for vehicles. 3,750,020, Cl. 325-5.000.

Babbitt, John H., Jr.; and Young, William A., Jr., to Caterpillar Tractor Company. Environmental seal for a transmission shift lever. 3,748,923, Cl. 74-566.000.

Babcock & Wilcox Company, The: *See—*
Strom, Steven S.; and Markant, Henry P., 3,749,380.

Babon, Paulette Aimee: *See—*
Langer, Robert Marie Gerard; and Babon, Paulette Aimee, 3,749,320.

Bach & Co.: *See—*
Pfenning, Hans, 3,750,060.

Bachle, Carl F., to Teledyne Industries, Inc. Filter cleaning system for internal combustion engine. 3,748,836, Cl. 55-302.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Bronstert, Klaus; Schmidt, Franz; and Schuette, Wilhelm, 3,749,755.
Merger, Franz; Fuchs, Werner; and Dockner, Toni, 3,749,749.

Baibekov, Murat Kazmukhametovich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Bailey, Edward A.; and Wolcott, Robert E. Centralizer. 3,749,454, Cl. 308-3.900.

Bailey, James R.; Klein, Carl F.; Korta, Lawrence B.; and Pridemore, Donald F., to Johnson Service Company. Intrusion detection apparatus having a high frequency diode oscillator-mixer element. 3,750,165, Cl. 343-5.0pd.

Baker, Don R., to Stauffer Chemical Company. Certain N-benzoyl-1,2,5,6-tetrahydropyridines. 3,749,730, Cl. 260-297.00r.

Baker, John H., to Schlumberger Technology Corporation. Including control means for controlling the signal resolution and the speed of response of the signal indicating means. 3,750,009, Cl. 324-1.000.

Bakker, Lubertus; and Krumm, Eugene D., to Air Preheater Company, Inc., The. Liquid incinerator. 3,749,029, Cl. 110-7.00r.

Bakul, Valentin Nikolaevich: *See—*
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

Balasubramanian, Xodandraman: *See—*
Johnstone, Robert F.; and Balasubramanian, Xodandraman, 3,749,114.

Balda-Werke: *See—*
Lange, Karl-Heinz; and Mailander, Manfred, 3,748,993.

Ballou, Milton L., to Knight Oil Corporation. Rotary brush. 3,748,678, Cl. 15-24.000.

Ballou, Raymond J.: *See—*
Sheker, Roger N.; and Ballou, Raymond J., 3,750,015.

Balse, Helmut; and Gorl, Richard, to Rheinstahl Aktiengesellschaft. Load lifting vehicle having a laterally adjustable ground supported element. 3,749,193, Cl. 180-9.480.

Balzano, Alfiero F.; and Regan, John F., to Eaton Corporation. Door lock electrical control unit. 3,748,878, Cl. 70-218.000.

Balzano, Alfiero F., to Eaton Corporation. Electric strike. 3,749,435, Cl. 292-341.160.

Ban, Itsuki, 50% each to Secoh Giken Company Limited and Miyata Electric Works, Inc. Electronic flash system. 3,748,989, Cl. 95-10.0ce.

Bandukwalla, Phiroze, to General Motors Corporation. Centrifugal compressor blading. 3,749,520, Cl. 416-183.000.

Bankert, Jon Calvin, Jr.; Lutchansky, Milton; Osifchin, Nicholas; and Willis, Clarence Jesse, to Bell Telephone Laboratories, Incorporated. Waveguide structure utilizing compliant helical support. 3,750,058, Cl. 333-95.00r.

Bannehr, Konrad: *See—*
Ludwig, Frank; Bannehr, Konrad; Rothe, Dieter; and Tschischke, Werner, 3,748,871.

Barak, Morton; and Winchell, Harry S., to Medi-Physics, Inc. Radiopharmaceutical generator kit. 3,749,556, Cl. 23-252.00r.

Barber-Colman Company: *See—*
Hiklert, Thomas L.; Fransson, Goran E.; and Trenbeath, Richard E., 3,748,962.

Bardwick, John, III. Inertial energy system for vehicles. 3,749,194, Cl. 180-54.00r.

Barker, Theodore R., II: *See—*
Koomey, Paul C.; Stivers, George S.; and Barker, Theodore R., II, 3,750,096.

Barkey, Kenneth T., to Eastman Kodak Company. Poly(ethylene terephthalate) polyester with lower diethylene glycol content. 3,749,697, Cl. 260-75.00r.

Barmag Barner Maschinenfabrik Aktiengesellschaft: *See—*
Remscheid, Horst Pawel; and Ruppel, Friedrich, 3,749,536.

Barnes, Charles M.; Kosaeski, Raymond, Jr.; and Putt, James S., to Bendix Corporation, The. Fluid level switch. 3,750,124, Cl. 340-244.00e.

Barnes, James A.; and Kesner, Donald R., to Motorola, Inc. Single ramp analog to digital converter with feedback. 3,750,142, Cl. 340-347.0cc.

Barrows, Robert E., to Chicago Pneumatic Tool Company. Vibrator unit for testing a motor vehicle for rattles and squeaks. 3,748,896, Cl. 73-71.500.

Barry, Gerald P.: *See—*
Kanengieter, Glenn G.; and Barry, Gerald P., 3,748,840.

Barston, William T.: *See—*
Beggs, Donald; and Barston, William T., 3,749,386.

Bartlett, Curry M. Gun butt holder. 3,749,348, Cl. 248-359.000.

Bartok, Le Ann. Footwear having transparent parts. 3,748,758, Cl. 36-34.00a.

Barton, Bruce H., to Emhart Corporation. Method and apparatus for erecting and bottom sealing cartons. 3,748,972, Cl. 93-53.00m.

Bartram, Nial; and Foard, James H., Jr., to Schick Incorporated. Electric razor end cap arrangement. 3,748,730, Cl. 30-43.100.

Basa, Napoleon A. Therapeutic boot construction. 3,749,091, Cl. 128-260.000.

BASF Wyandotte Corporation: *See—*
Pai, Panemangalore S., 3,749,751.

Bashkatov, Vylacheslav Vasilievich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., to Dow Chemical Company, The. Titanium dioxide pigment. 3,749,764, Cl. 423-610.000.

Bass, Sidney; Benson, John T.; and Shirwo, Darold M., to Mattel, Inc. Illuminated educational picture viewer toy. 3,748,765, Cl. 40-63.00a.

Bastian, Jean-Michel; Ebnother, Anton; and Rissi, Erwin, to Sandoz Ltd., a/k/a Sandoz AG. 1,3,4,9b-Tetrahydro indeno[1,2-c]pyridines. 3,749,729, Cl. 260-294.80b.

Batchelder, John M.; and Griswold, Augustus W., to Dapak Systems, Inc. Method and apparatus for preparing and assembling communications for mass distribution. 3,749,631, Cl. 156-350.000.

Bates, Charles. Valve having adjustable seating means. 3,749,358, Cl. 251-298.000.

Bates, David J.; Silzars, Ariz; Roberts, Lester A.; and Long, James A., to Watkins-Johnson Company. Electron bombarded semiconductor device. 3,749,961, Cl. 315-3.000.

Battelle Memorial Institute: *See—*
Stingelin, Valentin, 3,749,563.

Bauer, Kurt: *See—*
Edele, Reinhard; Bauer, Kurt; and Roth, Christian, 3,748,685.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Oral preparation containing unsymmetrical oligoquaternary ammonium compounds. 3,749,767, Cl. 424-54.000.

Baumann, Frederick W.; and Rosenberry, George M., Jr., to General Electric Company. Ventilated dynamoelectric machines. 3,749,953, Cl. 310-62.000.

Bausch & Lomb Incorporated: *See—*
Sahmel, Otto H., 3,748,907.

Baxter Laboratories, Inc.: *See—*
Berger, Arthur; and Borgaes, Edeltraut, 3,749,765.
Berger, Arthur; and Borgaes, Edeltraut E., 3,749,782.
Berger, Arthur; and Borgaes, Edeltraut E., 3,749,783.
Stone, Irwin M., 3,749,582.

Baxter, Robert David, to General Electric Company. Glow plug. 3,749,980, Cl. 317-98.000.

Bayer Aktiengesellschaft: *See—*
Fest, Christa; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,749,720.

Bayer, John W., to Owens-Illinois, Inc. Process for bonding a glass container to a cup-shaped fitment with hot melt adhesive. 3,749,630, Cl. 156-293.000.

Bayne, Peter D.: *See—*
Krueger, Robert K.; Bayne, Peter D.; and Weston, Steven S., 3,749,795.

Bazzarone, Fedele; and Bisone, Dario, to Ing. C. Olivetti & C. S.p.A. Device for feeding and sorting documents. 3,749,395, Cl. 271-4.000.

Beach, David E., to Eastman Kodak Company. Device for preventing film movement in still cameras. 3,748,991, Cl. 95-31.0fm.

Bean, Claude Thomas, Jr.: *See—*
Pawlak, Joseph A.; and Bean, Claude Thomas, Jr., 3,749,686.

Bean, Jerome Benjamin, Jr.: *See—*
Ahrens, Paul Raymond; and Bean, Jerome Benjamin, Jr., 3,749,966.

Bear Manufacturing Corporation: *See—*
Hansen, Warren T., 3,748,969.

Beasley, Maurice Trevor. Reflector panels for road vehicles. 3,748,724, Cl. 29-558.000.

Beaubien, Thomas S.: *See—*
Adickes, Cecil F.; Beaubien, Thomas S.; Weir, George R.; and Echterling, Eugene J., 3,749,402.

Beaucamp, Klaus: *See—*
Nelboeck-Hochstetter, Michael; and Beaucamp, Klaus, 3,749,709.

Beauchet, Jean, to Societe Nouvelle de Roulements. Tube cutting devices, notably for automatic lathes. 3,748,935, Cl. 82-70.10r.

Becker, Russell D. Traction pads. 3,749,309, Cl. 238-14.000.

Beckmann, Gunter; Dietrich, Johannes; and Pfeiffer, Kurt, to Chemische Werke Huls Aktiengesellschaft. Polymerization reactor. 3,749,555, Cl. 23-285.000.

Becton, Dickinson and Company: *See—*
Ellis, Donovan Russell, Jr.; and Markiewicz, Bernard Frank, 3,749,271.

Becton, Dickinson Electronics Company: *See—*
Cencel, J. Arthur, 3,750,113.

Bedford, John: *See—*
Martin, John Terry; Remmington, John Elstow; and Bedford, John, 3,750,110.

Beeken, Basil B.; and Ignatjev, Vladimir, to Automatic Switch Co., mesne. Fast acting, low pressure, two positioned valve. 3,749,127, Cl. 137-625.600.

Beggs, Donald; and Barston, William T., to Midland-Ross Corporation. Method and means for reducing iron oxides in a gaseous reduction process. 3,749,386, Cl. 266-29.000.

Bell, Antony Geoffrey, to Texas Instruments, Incorporated. Fault protected output buffer. 3,749,936, Cl. 307-202.000.

Bell, David. Process for removing metals from petroleum. 3,749,665, Cl. 208-253.000.

Bell Telephone Laboratories, Incorporated: *See—*
Bankert, Jon Calvin, Jr.; Lutchansky, Milton; Osifchin, Nicholas; and Willis, Clarence Jesse, 3,750,058.
Brady, Douglas MacPherson, 3,750,051.
Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,750,046.
Burus, Harry Shaner; Miller, Richard Carrel; and Sautter, Helmuth Otto, 3,749,829.
Caron, Lionel, 3,750,106.
Draegert, David Allison, 3,750,045.
Fellers, Rufus Gustavus; and Hinderks, Larry Wardell, 3,750,012.
Fraser, Alexander Gibson, 3,749,845.
Kao, Chih-Yu, 3,749,895.
Knollman, Dieter John Henry; and Simon, James Louis, 3,749,848.
Nelson, Richard Kent, 3,750,007.
Osborne, Thomas Lawrence, 3,750,143.
Roycraft, Theodore James; and Shelhan, John Robert, 3,749,843.
Sessler, Gerhard Martin; West, James Edward; and Hirsch, Alfred E., Jr., 3,750,149.
Testardi, Louis Richard, 3,750,153.

Belluck, Raymond E., to United States of America, Navy, mesne. Aided angle tracking device. 3,750,174, Cl. 343-18.00e.

Beloit Corporation: *See—*
Brezinski, Jerome P., 3,749,054.

Belokin, Paul, Jr. Psychedelic reflection device. 3,749,903, Cl. 240-10.100.

Belsher, Donald R.: *See—*
Bowman, Ronald R.; Larsen, Ezra B.; and Belsher, Donald R., 3,750,017.

Belstein, August, Firma: *See—*
De Baan, Johannes Jasper; and Adrian, Adolf, 3,749,210.

Bendix Corporation, The: *See—*
Barnes, Charles M.; Kosaeski, Raymond, Jr.; and Putt, James S., 3,750,124.
Cohen, Richard L.; and Taylor, Robert G., 3,749,997.
Faris, William R., 3,750,171.
Hietanen, Edwin D.; and Valek, Robert J., 3,749,496.
Kowalski, Daniel G., 3,749,492.
Rothfusz, Ralph W.; and Nagy, John R., 3,749,065.
Sawicki, Joseph J.; and Sharrow, John A., 3,750,176.
Shupe, David M., 3,749,475.
Tewksbury, John Merle, 3,750,179.
Tresselt, Carl P., 3,750,172.
Wieg, Heinrich J., 3,749,501.

Benjamin, John Stanwood; Cairns, Robert Lacock; and Weber, John Herbert, to International Nickel Company, Inc. Hot working of dispersion-strengthened heat resistant alloys and the product thereof. 3,749,612, Cl. 148-11.50f.

Benoit, Alfred E. Method of making archery arrow. 3,749,623, Cl. 156-187.000.

Benson, Gustav E., to Owens-Corning Fiberglas Corporation. Yarn treating apparatus. 3,749,055, Cl. 114-234.000.

Benson, John T.: *See—*
Bass, Sidney; Benson, John T.; and Shirwo, Darold M., 3,748,765.

Bentz, Francis: *See—*
Engelhard, Helmut; Bentz, Francis; Brokmeier, Dieter; and Nischk, Gunther, 3,749,701.

Benyon, Carl W., Jr.; and Leibowitz, Donald, to RCA Corporation. Electroacoustic semiconductor device employing an IGFET. 3,749,984, Cl. 317-235.00r.

Berg, Albert T., Jr.: *See—*
Langlie, Howard; and Berg, Albert T., Jr., 3,749,820.

Berg, Joseph A.; and Eames, Loren W. Seat having relatively adjustable sections. 3,749,442, Cl. 297-312.000.

Berg, Norman H., 20% to Lee, Raymond, Organization, Inc., The. Home fire standby hose assembly. 3,749,118, Cl. 137-355.280.

Berg, Raymond B.: *See—*
Andrzejak, Sigmund L.; and Berg, Raymond B., 3,749,387.

Berg, Rober M., to General Motors Corporation. Machining process. 3,749,625, Cl. 156-250.000.

Berg, Winfred M. Transmission belt. 3,748,917, Cl. 74-231.00r.

Bergen, Klaus: *See—*
Schmidt, Willi; Berzbach, Rainer; and Bergen, Klaus, 3,748,704.

Berger, Arthur; and Borgaes, Edeltraut, to Baxter Laboratories, Inc. Methods of antagonizing barbiturates with uracil thiopseudoureas. 3,749,765, Cl. 424-251.000.

Berger, Arthur; and Borgaes, Edeltraut E., to Baxter Laboratories, Inc. Uracil ureas for reviving an animal given an overdose of barbiturate. 3,749,782, Cl. 424-251.000.

Berger, Arthur; and Borgaes, Edeltraut E., to Baxter Laboratories, Inc. Uracil thioureas for reviving an animal given an overdose of barbiturate. 3,749,783, Cl. 424-251.000.

Berger, Carl F.: *See—*
Karplus, Robert; Montgomery, Marshall A.; and Berger, Carl F., 3,748,755.

Bergius, Mikko Hannu Tapani; Saarenketo, Tapio Keikki; and Keskilohko, Altti Kalervo. Planting tool for seedlings. 3,749,034, Cl. 111-4.000.

Bergman, Sylvester, to Dow Chemical Company, The. Process for treating synthetic fiber with a fire retardant and the treated fiber. 3,749,599, Cl. 117-136.000.

Bergman, Sylvester; and Pews, Richard Garth, to Dow Chemical Company, The. Fire retardant and dye receptive synthetic fibers. 3,749,600, Cl. 117-136.000.

Bergquist, Dwight H.: *See—*
Cook, Charles H.; and Bergquist, Dwight H., 3,748,919.

Bergsma, Wytse: *See—*
Kuiken, Hendrik; and Bergsma, Wytse, 3,748,731.

Berian, Albert G., to O'Brien, D. G., Inc. High pressure electrical feedthrough fitting. 3,750,088, Cl. 339-94.00a.

Beriger, Conrad, to Aktiengesellschaft Brown, Boveri & Cie. Arrangement for compensating parasitic capacitances in semiconductor rectifier assemblies. 3,749,983, Cl. 317-234.00r.

Berihoumifux, Robert: *See—*
Bousseau, Marcel-Gustave; and Berihoumifux, Robert, 3,749,528.

Berkau, Eugene E., to Monsanto Company. Novel catalyst systems in high molecular weight polyesters. 3,749,696, Cl. 260-75.00r.

Berkowitz, Irving L., to Kason Hardware Corporation. Self-closing door hinges. 3,748,688, Cl. 16-153.000.

Bernasconi, Gabriele: *See—*
Poretti, Isidoro; and Bernasconi, Gabriele, 3,750,141.

Berntsen Cast Products, Inc., mesne: *See—*
Berntsen, Peter, 3,748,795.

Berntsen, Peter, to Berntsen Cast Products, Inc., mesne. Survey monuments of frangible sections. 3,748,795, Cl. 52-98.000.

Bertin & Cie: *See—*
Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, 3,748,826.

Berzbach, Rainer: *See—*
Schmidt, Willi; Berzbach, Rainer; and Bergen, Klaus, 3,748,704.

Bethlehem Steel Corporation: *See—*
Kerecz, Bela J2, Jr., 3,749,245.

Better Packages, Inc.: *See—*
Ellner, Edwin, 3,749,013.

Beuth, Jack L.: *See—*
Andrews, William P.; and Beuth, Jack L., 3,749,629.

Bevan, Brian: *See—*
Bevan, Jane; and Bevan, Brian, 3,748,748.

Bevan, Jane; and Bevan, Brian. Voice puzzle game. 3,748,748, Cl. 35-8.00a.

Bever, Thomas L.: *See—*
Reichard, Thomas E.; and Bever, Thomas L., 3,749,499.

Beverett, James H. Automatic dripolator, single compartment. 3,748,999, Cl. 99-313.000.

Bianchi, Giancarlo Eletti: *See—*
Cavazza, Claudio; Bianchi, Giancarlo Eletti; and Diamanti, Enrico, 3,749,712.

Bianchi, John E. Front open holster with low mounting. 3,749,293, Cl. 224-2.00b.

Bibb, Everett I. Method of constructing reinforced articles having a plastic core, and frame therefor. 3,749,594, Cl. 117-104.00a.

Biehl, Richard E., to Materials Research Corporation. Heated substrate support station for sputtering systems. 3,749,662, Cl. 204-298.000.

Bigler, Boyd R.: *See—*
Bigler, David A.; Bigler, Boyd R.; and Bigler, Owen G., 3,748,742.

Bigler, David A.; Bigler, Boyd R.; and Bigler, Owen G. Cutlery tool. 3,748,742, Cl. 30-294.000.

Bigler, Owen G.: *See—*
Bigler, David A.; Bigler, Boyd R.; and Bigler, Owen G., 3,748,742.

Billerbeck, Fred W.; Everett, Lawrence H.; and Ritsema, Craig T., to Gerber Products Company. Sweetened storage stable peanut butter spread. 3,749,587, Cl. 99-128.000.

Billeter, Henry R., to Sloan Valve Company. Combination cut-out cock and dirt collectors. 3,748,837, Cl. 55-418.000.

Bini, Rodney James, to Norman, George, & Co., Pty., Ltd. Sheet material attaching means. 3,749,441, Cl. 297-223.000.

Bio-Controls Corporation: *See—*
Von Der Mosel, Hans A., 3,749,100.

Bird, James E.; and Carter, Paul R., to United States Steel Corporation. Can stock with differential protective coatings. 3,749,651, Cl. 204-56.00r.

Bisone, Dario: *See—*
Bazzarone, Fedele; and Bisone, Dario, 3,749,395.

Bissell Inc.: *See—*
Rosendall, Henry J., 3,748,679.

Bjork, Albion P.; and Conner, James M., to Polaroid Corporation. Camera system including operation sequence control. 3,748,987, Cl. 95-36.000.

Bjorklund, John R., Jr.: *See—*
Ehrlichmann, Merlin W.; and Bjorklund, John R., Jr., 3,749,032.

Black, Donald L. Holder for depressing a motor vehicle accelerator. 3,749,212, Cl. 192-3.00t.

Black Products Company: *See—*
Lau, Erwin M., 3,749,142.

Blackman, Kent G.; and Hrdlicka, Eugene R., to GTE Automatic Electric Laboratories, Incorporated. Multiple contact electrical connector. 3,750,091, Cl. 339-176.00m.

Blanyer, Carl G., to Abex Corporation. Speed detection method and apparatus. 3,750,019, Cl. 324-178.000.

Blattner, Hans; and Schindler, Walter, to Ciba-Geigy Corporation. Derivatives of dibenzo (b,f) pyrrolo (3,4-d) azepine in compositions and a method for producing a C.N.S. repressant effect. 3,749,790, Cl. 424-274.000.

Blessings, Inc.: *See—*
Mele, Sidney C.; and Hoyt, Earl, 2,749,274.

Blezard, Robert C., to Smithfield Fibers, Inc. Yarn knitting machine. 3,748,874, Cl. 66-86.000.

Blishak, Theodore L., to SCM Corporation. Time matrixing method of energizing selective segments of multi-cell liquid crystal displays. 3,750,139, Cl. 340-336.000.

Blitchington, Frank H., Jr., to Western Electric Company, Inc. Pattern sensing and positioning system. 3,749,830, Cl. 128-6.800.

Bloom, Stefan A. Insertable device package. 3,749,093, Cl. 128-263.000.

Boatwright, Daniel J.; and Hatcher, Lloyd T. Flush box for plug receptacles. 3,749,815, Cl. 174-66.000.

Bochko, Anatoly Vasilievich: *See—*
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

Bochory, Michael, to TRW Inc. Strain energy erectile tubular blam with stitched flanges. 3,749,133, Cl. 138-119.000.

Bock, Ortwin: *See—*
Weissenborn, Dieter; Bock, Ortwin; and Werding, Norbert, 3,750,023.

Bodor, Edward E.: *See—*
Pogonowski, Ivo C.; Carmichael, Paul D.; and Bodor, Edward E., 3,748,863.

Boehm, Otto, to Werkzeugbau GmbH. Rock drilling bit. 3,749,189, Cl. 175-394.000.

Boehringer Ingelheim G.m.b.H.: *See—*
Schmidt, Gunther; Engelhorn, Robert; and Leitold, Matyas, 3,749,785.

Boehringer Mannheim Gesellschaft mit beschrankter Haftung: *See—*
Nelboeck-Hochstetter, Michael; and Beaucamp, Klaus, 3,749,709.
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,749,724.

Boehringer, Raymond H.; and Vail, Robert E., to Emery Industries, Inc. Lubricant additive. 3,749,702, Cl. 260-97.500.

Boeing Company, The: *See—*
Schmitt, Hubert A., 3,748,948.

Boetller, Albert J.; Clarke, Allan M.; and Wheatley, Roger W., to Du Pont de Nemours, E. I., and Company. Recovery of spent sulfuric acid from chlorinated and nitrated benzoic acid derivatives. 3,749,648, Cl. 203-41.000.

Bofors (Great Britain) Co., Ltd.: *See—*
Tarrant, John, 3,748,762.

Bogaut, Andree: *See—*
Kalopissis, Gregoire; Bogaut, Andree; and Estradier, Francoise, 3,749,716.

Bogner, Gunther; and Schmidt, Fritz, to Siemens Aktiengesellschaft. Superconducting cable. 3,749,811, Cl. 174-15.000.

Bogue, John C.: *See—*
Sarbacher, Robert I., 3,749,608.

Boleky, Edward Joseph, III; and Scott, Joseph Hurlong, Jr., to RCA Corporation. Fabrication of semiconductor devices. 3,749,614, Cl. 148-188.000.

Boley, Robert A.: *See—*
Abnett, Albert C.; and Boley, Robert A., 3,750,010.

Bolte, Robert A.: *See—*
Von Hoevel, Edmund H.; and Bolte, Robert A., 3,748,850.

Bolus, Daniel; Lerouge, Claude Paul Henri; and Regnier, Marc Andre, to International Standard Electric Corporation. Transcoder for data exchanges between a delta modulation system and a PCM system. 3,750,144, Cl. 340-347.0dd.

Borden, Inc.: *See—*
Feinstein, Sumner Sheldon; Golner, Jerold Julius; D'Amato, Salvatore; and Trunk, Eugene John, 3,748,939.

Borg, Paul E.: *See—*
Branham, Donald R.; Borg, Paul E.; and Goerner, Douglas C., 3,749,183.

Borg-Warner Corporation: *See—*
Shiber, Samuel, 3,748,928.

Borgaes, Edeltraut: *See—*
Berger, Arthur; and Borgaes, Edeltraut, 3,749,765.

Borgaes, Edeltraut E.: *See—*
Berger, Arthur; and Borgaes, Edeltraut E., 3,749,782.
Berger, Arthur; and Borgaes, Edeltraut E., 3,749,783.

Borgardt, Henry, to Kraftco Corporation. Apparatus for packaging individual slices of cheese. 3,748,822, Cl. 53-180.000.

Boros, Yedidya. Building structure and method of erecting same. 3,748,805, Cl. 52-745.000.

Borstein, George R., to Remington Arms Company, Inc. Device for sorting improper lengths of articles. 3,749,242, Cl. 209-123.000.

Borup, Alf Lennart; and Hampin, Karl Rune, to Lesjofors AB. Spring-loaded clamping devices for fastening railroad rails. 3,749,310, Cl. 238-349.000.

Bosack, Irwin A.; and Sussman, Milton H., to American Optical Corporation. Vertical slit adjustment device for a slit lamp. 3,749,481, Cl. 351-14.000.

Bosch, Robert, G.m.b.H.: *See—*
Gerhard, Albert, 3,750,002.
Heiser, Joachim, 3,748,857.
Kuhn, Edgar, 3,750,006.

Bottcher, James H.; Pyles, Robert L.; and Rawls, John L., Jr., to Sperry Rand Corporation. Traveling wave tube interaction circuit manufacture. 3,748,729, Cl. 29-600.000.

Bourns, Inc.: *See—*
Bruder, Frank J., 3,750,078.

Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, to Sandoz Ltd. Organic compounds. 3,749,786, Cl. 424-267.000.

Boursier, Pierre, to Keyes Fibre Company. Stackable package with latticed cover. 3,749,235, Cl. 206-45.310.

Bousseau, Marcel-Gustave; and Berihoumifux, Robert, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Vacuum pumps. 3,749,528, Cl. 417-424.000.

Bowart, Walter H. Oracular card game. 3,749,406, Cl. 273-161.000.

Bower, James C., to Atomic Fire Equipment Company. Emergency fire extinguisher. 3,749,175, Cl. 169-31.00p.

Bowin, Richard E., to Union Special Machine Company. Thread cutting and wiping mechanism for group stitch sewing machine. 3,749,041, Cl. 112-252.000.

Bowles, Lloyd W., to Computer Image Corporation. System for blanking selected areas of a raster. 3,749,965, Cl. 315-22.000.

Bowman, Ronald R.; Larsen, Ezra B.; and Belsher, Donald R., to United States of America, Health, Education and Welfare. Electromagnetic field measuring device. 3,750,017, Cl. 324-72.000.

Boyajian, Myron J.: *See—*
Meyer, Theodore R.; and Boyajian, Myron J., 3,749,207.

Brader, James J., Jr.; and Griscom, Richard W., to Chemetron Corporation. Stabilized trans-diethylstilbestrol composition and process of making same. 3,749,801, Cl. 424-346.000.

Bradford, William R.: *See—*
Friedman, Robert H.; Krause, Julianne D.; and Bradford, William R., 3,749,174.

Bradshaw, Thomas Ian; and Tamsky, Morgan J., to Minnesota Mining and Manufacturing Company. Water-activated insect trap. 3,748,777, Cl. 43-114.000.

Brady, Douglas MacPherson, to Bell Telephone Laboratories, Incorporated. Multi-level modulator for coherent phase-shift keyed signal generation. 3,750,051, Cl. 332-9.00r.

Brady, W. H., Co.: *See—*
Mrozek, James M., 3,748,977.

Brammall, Inc.: *See—*
Van Gompel, James J., 3,749,365.

Bramwell, Susan Elizabeth: *See—*
Carr-Brion, Kenneth Garfield; and Bramwell, Susan Elizabeth, 3,749,910.

Branchesi, Millo: *See—*
Cantatore, Giuseppe; and Branchesi, Millo, 3,749,694.

Brand, Karl. High pressure hose coupling. 3,749,427, Cl. 285-382.200.

Brandt, Edison R.; Cronin, David V.; and Skurski, James K., to Polaroid Corporation. Flash socket assembly. 3,748,980, Cl. 95-11.00r.

Brandt, Edison R., to Polaroid Corporation. Photoflash apparatus. 3,748,985, Cl. 95-11.00r.

Branham, Donald R.; Borg, Paul E.; and Goerner, Douglas C., to Pyramid Derrick & Equipment Corporation. Deep well drilling apparatus. 3,749,183, Cl. 173-151.000.

Breglia, Denis R.; Rodemann, Alfred H.; and Mohon, Windell N., to United States of America, Navy. Laser machine gun simulator. 3,748,751, Cl. 35-25.000.

Brewer, Stanley F.: *See—*
Downes, George R., Jr.; Brewer, Stanley F.; and Murtha, James E., 3,750,005.

Brezinski, Jerome P., to Beloit Corporation. Cantilever support structure including a stationary shaft, a hollow roll shell, and a fluid pressure chamber therebetween. 3,749,054, Cl. 118-126.000.

Brichard, Edgard, to Glaverbel S.A. Glass melting furnace flow channel support. 3,749,564, Cl. 65-184.000.

Bristol-Myers Company: *See—*

Kellmann, Erik; and Krohn, Rasmus, 3,749,106.
Britz, John A. Automated changer-player for magnetic tape cartridge recordings. 3,749,410, Cl. 274-4.00f.
Brock, James Donald, to CMI Corporation. Expansion system for asphalt plant oil heater. 3,749,082, Cl. 126-343.50a.
Brockett, Halford E.; and Melberg, Robert C., to Continental Can Company, Inc. Deformable closure for containers. 3,749,272, Cl. 215-40.000.
Brodeur, Dame Lillian: *See—*
Sheppard, Gordon M., 3,748,808.
Brokmeier, Dieter: *See—*
Engelhard, Helmut; Bentz, Francis; Brokmeier, Dieter; and Nischk, Gunther, 3,749,701.
Bronson, George K.: *See—*
George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., 3,749,151.
Bronstert, Klaus; Schmidt, Franz; and Schuette, Wilhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Thermoplastic molding compositions of high impact resistance. 3,749,755, Cl. 260-876.00r.
Brooks, Carl H.: *See—*
Steinle, John T.; and Brooks, Carl H., 3,749,264.
Broome, Barry G.: *See—*
Willoughby, John H.; and Broome, Barry G., 3,749,477.
Brown & Root, Inc.: *See—*
Hauber, Ferdinand R., 3,749,429.
Brown, Cicero C. Automated pipe handling apparatus. 3,748,702, Cl. 24-263.0dg.
Brown, Clifford Gordon: *See—*
Stibbs, Donald; Brown, Clifford Gordon; and Thompson, Raymond, 3,749,571.
Brown, Dale H., to General Electric Company. System for thermal exhaust. 3,749,379, Cl. 261-79.00a.
Brown, David John Lyne, to Commonwealth of Australia, care of the Secretary Department of the Navy, The. Velocimeter for determining the maximum or minimum relative velocity between two bodies. 3,750,170, Cl. 343-8.000.
Brown, Fred P., Jr., to Packaging Industries, Inc. Preform reshaping means having web distortion control device. 3,749,544, Cl. 425-397.000.
Brown, Gordon M.; and Porter, Kenneth R., to GCO, Inc. Extended field depth holographic method and apparatus. 3,749,470, Cl. 350-3.500.
Brown, James D. Waste treatment system. 3,749,243, Cl. 210-104.000.
Brucker, Robert J., to Kinedyne Corporation. Ratchet buckle. 3,749,366, Cl. 254-164.000.
Bruckner, Ronald L.; and Helmbold, James E., to National Cash Register Company, The. Stepping motor exciter apparatus and method. 3,750,000, Cl. 318-696.000.
Bruder, Frank J., to Bourns, Inc. Radio-frequency attenuator. 3,750,078, Cl. 338-150.000.
Bryant, Sherman G. Plastic minnow. 3,748,774, Cl. 43-42.100.
Br5deur, Philip: *See—*
Sheppard, Gordon M., 3,748,808.
Buchheit, Dieter, to Werner & Pfleiderer. Screw extruder for the treatment of pulverized material. 3,749,374, Cl. 259-192.000.
Buck, Homer G. Rotary die apparatus and process for manufacturing labels or the like. 3,749,626, Cl. 156-251.000.
Buckbee-Mears Company: *See—*
Mentone, Pat F., 3,749,010.
Budd, Allan L.: *See—*
Wilkins, Paul E.; and Budd, Allan L., 3,749,495.
Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, to Bell Telephone Laboratories, Incorporated. Silver-doped cadmium tin phosphide laser. 3,750,046, Cl. 331-94.50h.
Buerr, Dieter, to Ciba-Geigy AG. 3-Fluoro-4-broma-phenylisocyanate. 3,749,746, Cl. 260-453.0ar.
Buffiere, Jean-Pierre, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Exchange process. 3,749,155, Cl. 165-1.000.
Buffum, Edmond E. Feeder dish for traveling animals. 3,749,063, Cl. 119-61.000.
Bugaut, Andree: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 3,749,768.
Bulian, Walter; and Dittmar, Armin, to Wintershall Aktiengesellschaft. Process for optimum absorption of elemental sulfur from natural gas by the use of mineral oil and similar liquid hydrocarbons. 3,748,827, Cl. 55-73.000.
Bulova Watch Company, Inc.: *See—*
Mutter, William W.; and Grunner, George P., 3,748,845.
Bunker Ramo Corporation, The: *See—*
Scheiterbauer, Adolf R.; and Stickdorn, Helmut, 3,750,079.
Bunker-Ramo Corporation, The: *See—*
Gregg, Roland S., 3,750,147.
Burden, Roy B., Jr.; and O'Gieblyn, Erjest J., to Wasteco, Inc. Heating and exhaust emission control system and method for material dryers. 3,749,030, Cl. 110-8.00r.
Burden, Roy B., Jr., to Wasteco, Inc. Controlled atmosphere incinerator. 3,749,031, Cl. 110-8.00r.
Burgan, Paul G.; and Jekiel, Richard J., to Wentworth, Richard G. Visual display system. 3,750,138, Cl. 340-334.000.
Burger, Edwin M., to Oliver Tire & Rubber Company. End plug assembly for pipe. 3,749,131, Cl. 138-89.000.
Burgess, James Henry: *See—*
Tindale, John Basil; and Burgess, James Henry, 3,748,713.
Burgess, Lester E., to Gulf & Western Industrial Products Company. Metal coated plastic cartridge case and method of manufacture. 3,749,021, Cl. 102-43.00p.
Burlington Industries, Inc.: *See—*
Leach, Jack, 3,749,222.
Burlong, Donn B.; and Luzaich, Samuel, to Ecodyne Cooling Products Company. Fill hanger. 3,749,381, Cl. 261-111.000.
Burn, Joseph, to J & H Co. Machine for covering a pallet with shrinkable plastic film. 3,748,812, Cl. 53-66.000.
Burroughs Corporation: *See—*
Chang, Hoy Ying, 3,750,104.
Diepart, Paul; Gransart, Philippe; and Maitrias, Gerard, 3,749,940.
Burrows, Philip Richard Miles; Hem, Svein; and Terry, Michael Peter Alwyn, to Reed International Limited. Sampled data control. 3,749,891, Cl. 235-150.000.
Burrows, Philip Richard Miles; Raymond, Ian McGrath; and Terry, Michael Peter Alwyn, to Reed International Limited. Automatic control. 3,750,036, Cl. 328-151.000.
Burus, Harry Shaner; Miller, Richard Carrel; and Sautter, Helmuth Otto, to Bell Telephone Laboratories, Incorporated. Slow scan procedure for high resolution graphics mode video scene compatible with conditional replenishment type of bandwidth reduction. 3749,829, Cl. 178-6.800.
Bury, Allen J., to Molex Incorporated. Range surface receptacle. 3,750,092, Cl. 339-192.0rl.
Buryrus-Erie Company: *See—*
Grider, Lyle D., 3,749,254.
Busch, Richard E., to Addmaster Corporation. Paper feed mechanism for data printers. 3,749,221, Cl. 197-116.000.
Busche, Kenneth A. Programmed illumination of panel display sections. 3,749,484, Cl. 353-30.000.
Buschen, Bernard J. Tool holder rack. 3,749,252, Cl. 211-60.00t.
Buscher, Richard G.; and Davis, Richard L., to Lear Siegler, Inc. Electrically synchronized controllers. 3,748,749, Cl. 35-11.000.
Bush, Carl D.; and Root, Robert S., to Lipe Rollway Corporation. Fluid clutch with self-contained pump. 3,749,217, Cl. 192-113.00b.
Buzek, Vernon T.: *See—*
Stoll, Russell F.; Reed, Alan B.; and Buzek, Vernon T., 3,749,871.
Buzzi, Gunther: *See—*
Luder, Ernst; and Buzzi, Gunther, 3,749,345.
Cadiou, Jean, to S.A. Automobiles Citroen. Ash trays for motor vehicles. 3,749,466, Cl. 312-245.000.
Caillouet, Louis A., Jr., to Connelly, T. J., Construction Company. Smoke sensing circuit with battery standby. 3,750,123, Cl. 340-237.00r.
Cairns, Robert Lacock: *See—*
Benjamin, John Stanwood; Cairns, Robert Lacock; and Weber, John Herbert, 3,749,612.
Calcatco, Inc.: *See—*
James, Maurice L., 3,749,258.
Calgon Corporation: *See—*
Joyce, Ronald Stone; and Stoneburner, George Robert, 3,748,829.
California Institute of Technology: *See—*
Crow, Robert Bruce, 3,750,035.
Camacho, Salvador L., to Technology Application Services Corporation. Vessel preheating method and apparatus. 3,749,802, Cl. 13-1.000.
Camacho, Salvador L., to Technology Application Services Corporation. Through hearth construction and method for plasma arc furnace. 3,749,803, Cl. 13-9.000.
Camo, Incorporated: *See—*
Tausch, Gilbert H.; and Watkins, Fred E., 3,749,119.
Camp, Harold E.: *See—*
Grier, John D.; and Camp, Harold E., 3,749,487.
Campman, Arthur R.: *See—*
Rheaume, Walter A.; and Campman, Arthur R., 3,749,138.
Canadian International Paper Company: *See—*
Hamilton, Douglas D., 3,749,143.
Canon Kabushiki Kaisha: *See—*
Moriya, Shozo; Ohta, Shoji; Iwawaki, Yasutaka; and Usui, Yukio, 3,749,852.
Cantatore, Giuseppe; and Branchesi, Millo, to Montecatini Edison S.p.A. Stabilization of textile fibers, films and other shaped objects of polymeric alpha-olefins. 3,749,694, Cl. 260-41.00r.
Canup, Robert E., to Texaco Inc. Continuous wave high frequency ignition system. 3,749,973, Cl. 315-209.000.
Capitol Products Corporation: *See—*
Cribben, James T., 3,748,814.
Captain International Industries, Ltd.: *See—*
Ungerman, Warren J., 3,749,279.
Caputo, William R., to Westinghouse Electric Corporation. Elevator system. 3,749,204, Cl. 187-29.000.
Carborundum Company, The: *See—*
Carpenter, James Hugh; and Good, Harper Willard, 3,748,787.
Cardarelli, Nathan F.; and Mansdorf, Seymour Zachary, to University of Akton, The. Dermal protective film. 3,749,772, Cl. 424-81.000.
Carenza, Edward C.: *See—*
Weinstein, Howard; and Carenza, Edward C., 3,749,064.
Carey, Peter M.; and Holmwood, Owen L., to Lektromedia Ltd. Low resolution graphics for CRT displays. 3,750,135, Cl. 340-324.0ad.

Carlson, Gerald J.; and Summerhayes, Harry R., to General Electric Company. Optical caliper and edge detector-follower for automatic gaging. 3,749,500, Cl. 356-156.000.

Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., to International Business Machines Corporation. Print hammer assembly. 3,749,008, Cl. 101-93-c.

Carmichael, Paul D.: *See—*
Pogonowski, Ivo C.; Carmichael, Paul D.; and Bodor, Edward E., 3,748,863.

Caron, Lionel, to Bell Telephone Laboratories, Incorporated. Variable function magnetic domain arrangement. 3,750,106, Cl. 340-172.500.

Carpenter, James Hugh; and Good, Harper Willard, to Carborundum Company, The. Workpiece treating apparatus. 3,748,787, Cl. 51-15.000.

Carpenter, Richard L.: *See—*
Ashen, Ronald H. K.; and Carpenter, Richard L., 3,749,191.

Carr-Brion, Kenneth Garfield; and Bramwell, Susan Elizabeth, to National Research Development Corporation. Determination of the mean size of solid particles contained in a fluid by scattering of X-radiation. 3,749,910, Cl. 250-273.000.

Carrasse, Jean, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Vehicle propulsion system. 3,749,026, Cl. 104-156.000.

Carrier Corporation: *See—*
Miller, Robert A.; and Miller, Arthur J., 3,749,512.
Samurt, Norman A.; Geary, Carl H.; and Damratowski, Leonard P., 3,749,516.

Carter, Andrew G.; and Morgan, Charles L., to Carter Products Company, Inc. Shadow-line projector for assembly reference. 3,749,485, Cl. 353-62.000.

Carter, Paul R.: *See—*
Bird, James E.; and Carter, Paul R., 3,749,651.

Carter Products Company, Inc.: *See—*
Carter, Andrew G.; and Morgan, Charles L., 3,749,485.

Carter, Ray L. Hanger device with foldable arms. 3,749,253, Cl. 211-171.000.

Carwood, Blaine E. Drive mechanism for a self-propelled irrigation system. 3,749,117, Cl. 137-344.000.

Case, Leo L.: *See—*
Koltuniak, Michael A.; Urquhart, Thomas N.; and Case, Leo L., 3,749,981.

Cash, David R., to Cash, James, Machine Co. Dual head for a multi-needle sewing machine. 3,749,037, Cl. 112-117.000.

Cash, James, Machine Co.: *See—*
Cash, David R., 3,749,037.

Castel, Yvon: *See—*
Joubert, Philippe; and Castel, Yvon, 3,749,367.

Castleberry, Joseph C., to Altec Manufacturing Company, Inc. Hydraulic booster. 3,748,860, Cl. 60-563.000.

Caterpillar Tractor Co.: *See—*
Ward, Thomas V., 3,749,523.

Caterpillar Tractor Company: *See—*
Babbitt, John H., Jr.; and Young, William A., Jr., 3,748,923.
Liess, Richard K., 3,748,759.
Miller, Kenneth J.; and Patton, Eugene K., 3,748,889.
Smith, Duane R., 3,748,711.

Cavazza, Claudio; Bianchi, Giancarlo Eletti; and Diamanti, Enrico, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Triamcinolone acetonide esters and process for their preparation. 3,749,712, Cl. 260-239.550.

Cayton, David Walter; and Johnson, Leslie William, to Deere & Company. Precision depth seed planter. 3,749,035, Cl. 111-85.000.

Celanese Corporation: *See—*
Patella, Ralph F., 3,749,690.
Soehngen, John W., 3,749,633.

Cencel, J. Arthur, to Becton, Dickinson Electronics Company. Capacitive keyboard. 3,750,113, Cl. 340-173.0sp.

Cenco Medical/Health Supply Corporation: *See—*
Taylor, Stanley E., 3,749,238.

Ceraver: *See—*
Foucry, Jean; and Auriol, Alain, 3,749,595.

Ceskoslovenska akademie ved: *See—*
Putterlik, Jan, 3,749,304.

Chance, A. B., Company: *See—*
Jenkins, Robert B., 3,749,430.

Chandler Evans Inc.: *See—*
Rabinowitz, Charles M., 3,748,897.

Chang, Edward H., to Fremont Industries, Inc. Phosphate-free detergents. 3,749,675, Cl. 252-135.000.

Chang, Hoy Ying, to Burroughs Corporation. Method and apparatus for synchronizing a dynamic recirculating shift register with asynchronously rotating memories. 3,750,104, Cl. 340-172.500.

Chant, Albert H., Jr., to Dove, J. B., Inc. Film straightener apparatus for wrapping articles in stretchable film. 3,748,825, Cl. 53-379.000.

Charon, Clarence W.: *See—*
Renaud, Laurent C.; and Charon, Clarence W., 3,749,638.

Charter Arms Corporation: *See—*
McClenahan, Douglas S., 3,748,744.

Chatourel, Pierre: *See—*
Fauquembergue, Jean G.; Lingrand, Michel; Peltier, Henri; and Chatourel, Pierre, 3,749,153.

Chemetron Corporation: *See—*
Brader, James J., Jr.; and Griscom, Richard W., 3,749,801.

Chemische Werke Huls Aktiengesellschaft: *See—*
Beckmann, Gunter; Dietrich, Johannes; and Pfeiffer, Kurt, 3,749,555.

Chen, Arthur C. M.; and Wang, Jish-Min, to General Electric Company. Electron beam addressable archival memory. 3,750,117, Cl. 340-173.01s.

Cherk, Ester; and Wyckoff, Garry D. Toy animal figure. 3,748,779, Cl. 46-115.000.

Cherniak, Victor B. Saddle clip for hanging light fixtures. 3,749,346, Cl. 248-302.000.

Chetwynde, Clyde H. Snow handling device. 3,748,761, Cl. 37-130.000.

Chevron Research Company: *See—*
De Vries, Louis, 3,749,695.

Chicago Bridge & Iron Company: *See—*
Laverman, Royce Jay; and Agrawal, Govind M., 3,748,865.

Chicago Pneumatic Tool Company: *See—*
Barrows, Robert E., 3,748,896.

Childress, Scott J.: *See—*
Freed, Meier E.; and Childress, Scott J., 3,749,725.

Christensen, Eric A.; and Schilling, Robert W., to Midland-Ross Corporatio2. Aircraft anti-icing apparatus. 3,749,336, Cl. 244-134.00b.

Christenson, Roger M.: *See—*
Lebras, Louis R.; Christenson, Roger M.; and Zwack, Robert R., 3,749,657.

Christensson, Od W., to Christenssons Maskiner & Patenter Aktiebolag. Arrangement for filling and closing packages, comprising an outer package and an inner package loosely applied therein. 3,748,819, Cl. 53-124.00b.

Christenssons Maskiner & Patenter Aktiebolag: *See—*
Christensson, Od W., 3,748,819.

Chromium Corporation of America: *See—*
Schweikher, Ernest W., 3,749,072.

Chrysler Corporation: *See—*
Kissel, William R., 3,749,974.

Chugunov, Viktor Dmitrievich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

Chute, Richard, to Eaton Corporation. Fluid turbomotor. 3,749,513, Cl. 415-152.000.

Ciba-Geigy AG: *See—*
Buerr, Dieter, 3,749,746.
Froehlich, Alfred, 3,749,573.
Hegar, Gert, 3,749,708.
Piller, Bernhard, 3,749,576.
Toepfl, Werner, 3,749,788.

Ciba-Geigy Corporation: *See—*
Blattner, Hans; and Schindler, Walter, 3,749,790.
Rody, Jean; and Lind, Hanns, 3,749,732.

Ciga-Geigy Corporation: *See—*
Gannon, John Allister, 3,749,758.

Cima, Robert H. Laundry-carrying case. 3,749,211, Cl. 190-49.000.

Cincinnati Milacron, Inc.: *See—*
Kauffman, Harry D., 3,749,876.

Cincinnati Mine Machinery Co., The: *See—*
Krekeler, Claude B., 3,749,449.

Cities Service Oil Company: *See—*
Lockwood, William H., Jr.; and Hebert, Hugh P., 3,749,666.

Clampitt, Richard L.: *See—*
Hessert, James E.; and Clampitt, Richard L., 3,749,172.

Clark Equipment Company: *See—*
Conrad, Marcus L., 3,749,269.
Dence, Donald Spencer, 3,749,206.

Clark, J. L., Manufacturing Co.: *See—*
Foster, John A., 3,749,230.

Clark, James; McMenim, Michael Edward; and Rose, Francis Leslie, to Imperial Chemical Industries, Limited. Process for amino-s-triazolo-[4,3-a] pyrozines. 3,749,719, Cl. 260-250.00r.

Clark, Marvin A. Service cord fitting and connector. 3,750,089, Cl. 339-97.00r.

Clark, Peter I.: *See—*
Sallberg, David W.; Clark, Peter I.; Parker, Wesley R.; and Nicholson, Robert D., 3,749,128.

Clark, Peter Stanley: *See—*
Nangarrow, John; Jones, Paul Victor; and Clark, Peter Stanley, 3,749,628.

Clarke, Allan M.: *See—*
Boetller, Albert J.; Clarke, Allan M.; and Wheatley, Roger W., 3,749,648.

Clarke, Jesse E., to Autoquip Corporation. Ambulatory elevator with folding platform. 3,749,201, Cl. 187-9.000.

Clarkson, W. J., Limited: *See—*
Dodsworth, Alfred Manston Heeley, 3,749,038.

Clecak, Nicholas J.; and Cox, Robert J., to International Business Machines Corporation. Novel azide compounds. 3,749,713, Cl. 260-240.00r.

Clech, Albert; Marchand, Georges; and Pasquiou, Jean-Yves, to Commissariat A L'Energe Atomique. Mixing device for powdered materials. 3,749,370, Cl. 259-10.000.

Clough, Douglas W., to Poly-Optics, Inc. Optical fiber display. 3,749,901, Cl. 240-2.000.

CMI Corporation: *See—*
Brock, James Donald, 3,749,082.
Coachmen Industries, Inc.: *See—*
Ferguson, Robert E., 3,749,439.
Cochran, Todd Dresser, to Eastman Kodak Company. Camera apparatus for controlling diaphragm and shutter speed. 3,748,974, Cl. 95-10.0ce.
Cohen, Martin G.: *See—*
Daly, Richard T.; Kaplan, Robert A.; and Cohen, Martin G., 3,749,476.
Cohen, Peter J.; and Ackerman, Philip W., to Databit Incorporated. Time division multiplexing for telex signals. 3,749,841, Cl. 179-15.0ba.
Cohen, Richard L.; and Taylor, Robert G., to Bendix Corporation, The. Multi-speed potentiometer servo. 3,749,997, Cl. 318-592.000.
Coileraft, Inc.: *See—*
Renskers, John O., 3,750,069.
Colbath, Dan L. Roll-forming machine. 3,748,884, Cl. 72-238.000.
Cole, Larry E.; and Zabsky, John M. Self-stabilizing pressure compensated injector. 3,748,852, Cl. 60-39.650.
Coleman Company, Inc., The: *See—*
Conley, James Robert, 3,749,356.
Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 3,749,767.
Douglas, Livingston C., 3,749,286.
Collins Radio Company: *See—*
Hirvela, Robert J., 3,749,897.
Rooks, Howard B., 3,750,177.
Colorado Instruments, Inc.: *See—*
Webb, Richard C.; Webb, James R.; and Tyler, Tommy N., 3,749,859.
Colyn, Roland, to Compagnie Generale d'Electricite. Supply system having short-circuit voltage regulation. 3,749,976, Cl. 315-241.00r.
Combustion Engineering, Inc.: *See—*
Raftis, George Joseph, 3,749,115.
Commissariat A L'Energe Atomique: *See—*
Clech, Albert; Marchand, Georges; and Pasquiou, Jean-Yves, 3,749,370.
Commonwealth of Australia, care of the Secretary Department of the Navy, The: *See—*
Brown, David John Lyne, 3,750,170.
Compagnie des Freins et Signaux Westinghouse: *See—*
Deschenes, Roger, 3,749,452.
Compagnie Generale d'Automatisme: *See—*
Foury, Georges, 3,749,263.
Compagnie Generale d'Electricite: *See—*
Colyn, Roland, 3,749,976.
Compagnie Generale d'Entreprises Electriques: *See—*
Debaigt, Jean, 3,750,093.
Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie: *See—*
Dillenschneider, Jean-Paul, 3,749,558.
Compagnie Industrielle Francaise des Tubes Electroniques: *See—*
Nicolas, Michel; and Alison, Jacques, 3,749,562.
Compagnie Internationale pour l'Informatique, mesne: *See—*
Lemoine, Jean H., 3,749,832.
Computer Image Corporation: *See—*
Bowles, Lloyd W., 3,749,965.
Comtec Industries, Inc.: *See—*
Sheker, Roger N.; and Ballou, Raymond J., 3,750,015.
Comtech Laboratories, Inc.: *See—*
Kliphuis, Jans, 3,749,999.
Cone, Richard E., II: *See—*
Ellies, Alan David; and Cone, Richard E., II, 3,748,778.
Conley, James Robert, to Coleman Company, Inc., The. Adaptor coupling for fluid flow conduits. 3,749,356, Cl. 251-148.000.
Connelly, Richard L. Ventilated stackable animal cages. 3,749,061, Cl. 119-19.000.
Connelly, T. J., Construction Company: *See—*
Caillouet, Louis A., Jr., 3,750,123.
Conner, James M.: *See—*
Bjork, Albion P.; and Conner, James M., 3,748,987.
Conrad, Marcus L., to Clark Equipment Company. Control system for a vehicle engine. 3,749,269, Cl. 214-762.000.
Consiglio Nazionale delle Richerche: *See—*
De Rossi, Mario, 3,749,606.
Constable, Charles F.: *See—*
Pagdin, William G.; and Constable, Charles F., 3,749,004.
Constantinescu, Petre; Popescu, Mihail; and Dumitrescu, Constantin, to Institutal de Proiectari al Industriei Usoare Ipiu. Prefabricated girder channel for ventilation heating or air conditioning of the industrial halls. 3,748,801, Cl. 52-173.000.
Construction Technology, Inc.: *See—*
Lance, Raymond E., 3,749,506.
Consyne Corporation: *See—*
Wildman, Alexander J., 3,748,740.
Continental Can Company, Inc.: *See—*
Brockett, Halford E.; and Melberg, Robert C., 3,749,272.
Continental Oil Company: *See—*
Johnson, Wade M.; and Ruckle, Robert A., 3,749,420.
Sparlin, Derry D.; and Hunt, Mack W., 3,749,589.
Contraves AG: *See—*
Schilter, Max, 3,748,764.
Controlled Power Corporation: *See—*
Koltuniak, Michael A.; Urquhart, Thomas N.; and Case, Leo L., 3,749,981.
Conwed Corporation: *See—*
Gaffney, Bernard J.; and Larsen, Ronald L., 3,749,535.
Cook, Charles H.; and Bergquist, Dwight H., to Henningsen Foods, Inc. Sanitary chain. 3,748,919, Cl. 74-249.000.
Cook, Henry S.; and Schwartz, Robert E., to National-Southwire Aluminum Company. Crucible bail locking device. 3,749,388, Cl. 266-39.000.
Cook, Henry S.; and Smith, Sam L. Anode transport frame locking device. 3,749,661, Cl. 204-286.000.
Coone, Malcolm G. Method and apparatus for an aggregate pump. 3,749,521, Cl. 417-53.000.
Coontz, John G. Bulldozer attachment for tractors. 3,749,180, Cl. 172-801.000.
Cooper, Frederick David, to S.D.C. Products (Electronics) Limited. Plug and socket connectors and sockets therefor. 3,750,085, Cl. 339-75.00m.
Cooper, Glenn D., to General Electric Company. Process for the preparation of polyphenylene ethers and compositions containing the same. 3,749,693, Cl. 260-47.0et.
Cooper, James Joseph, Jr., to International Telephone and Telegraph Corporation. Current limiter system. 3,750,075, Cl. 337-158.000.
Cooper, Ray E.: *See—*
Lockerd, Robert M.; Smith, Mark W.; Cooper, Ray E.; and Goode, George E., 3,750,175.
Cope, Geoffrey Wilton, to Dresser Industries, Inc. Cushion underframe. 3,749,255, Cl. 213-8.000.
Cordis Corporation: *See—*
Williamson, Donald E., 3,749,101.
Cornelsen, David J., to Armco Steel Corporation. Plunger Packing wash system. 3,749,529, Cl. 417-437.000.
Corning Glass Works: *See—*
Howitt, John S.; and Pitbladdo, Richard B., 3,749,130.
Watson, James H. P., 3,748,728.
Cort, Winifred; and Newmark, Harold Leon, to Hoffman-La Roche Inc. Stable dry vitamin A preparations. 3,749,799, Cl. 424-344.000.
Cortez, Al, Sr.: *See—*
Deaton, Felix W., 3,748,705.
Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,749,394.
Cotey, John, to Medspec, Inc. Digital amniotome. 3,749,099, Cl. 128-361.000.
Cotta Ramusino, Francesco: *See—*
Galbarini, Masu; and Cotta Ramusino, Francesco, 3,748,965.
Cottell, Eric C. Combustion method and apparatus burning an intimate emulsion of fuel and water. 3,749,318, Cl. 239-102.000.
Cotton, Incorporated: *See—*
Wilkes, Lambert H.; and Jones, Joseph K., 3,749,003.
Couch, Richard H.: *See—*
Schrader, James H.; and Couch, Richard H., 3,750,168.
Covington, Cecil E.; and Puckett, Joe D., to Textron Inc. Powered folding mechanism. 3,749,515, Cl. 416-143.000.
Cowan, John R.: *See—*
Dunn, James G.; and Cowan, John R., 3,750,024.
Cox, Charles S.: *See—*
Gregg, Michael C.; and Cox, Charles S., 3,748,899.
Cox, Colin John; and Hepburn, John James, to Lever Brothers Company. Preparation of a lactic spread. 3,749,583, Cl. 99-59.000.
Cox, Robert J.: *See—*
Clecak, Nicholas J.; and Cox, Robert J., 3,749,713.
Cox, Thomas L., to J & J Manufacturing Company. Packaging method and machine. 3,748,811, Cl. 53-28.000.
Craig, Floyd W. Boot bag. 3,749,232, Cl. 206-7.00g.
Craig, Fred A., to FMC Corporation. Two-way pressure hatch and latching means therefor. 3,748,785, Cl. 49-394.000.
Crall, Donald H. System for reefing and furling staysails. 3,749,043, Cl. 114-106.000.
Cramer, Bernhard; and Schilling, Helmut W., to International Standard Electric Corporation. Photoelectric keyboard for data input devices or the like. 3,750,150, Cl. 340-365.00p.
Crepeau, Robert G., to Allen-Bradley Company. Sealed limit switch. 3,749,860, Cl. 200-47.000.
Creuzet, Robert. Extrusion machine. 3,748,885, Cl. 72-269.000.
Cribben, James T., to Capitol Products Corporation. Decorative metal grid system for windows. 3,748,814, Cl. 52-668.000.
Cromwell, Thomas M.; and Sprague, Robert W., to United States Borax & Chemical Corporation. Method of preparing boric oxide. 3,749,792, Cl. 423-278.000.
Cronin, David V.: *See—*
Brandt, Edison R.; Cronin, David V.; and Skurski, James K., 3,748,980.
Cross, John F., to Noni Corporation. Vapor generator. 3,749,077, Cl. 126-44.000.
Cross, Norman A.; and Polak, James C., to General Motors Corporation. Hydrostatic transmission and method of transmitting power therethrough. 3,748,924, Cl. 74-677.000.
Croup, Robert E.: *See—*
Everitt, Scott F.; Croup, Robert E.; and Strawn, Alvin A., 3,749,198.
Crow, Robert Bruce, to California Institute of Technology. Frequency discriminator and phase detector circuit. 3,750,035, Cl. 328-133.000.

Crowley, Daniel Joseph, to AMP Incorporated. Read head assembly for card reader. 3,749,888, Cl. 235-61.11c.

Cruse, Robert R.; and Lime, Bruce J., to United States of America, Agriculture. Process for preparing citrus puree. 3,749,585, Cl. 99-100.000.

Crutchfield, Marvin M., to Monsanto Company. Detergent compositions. 3,749,676, Cl. 252-135.000.

Crystal Thermoplastics, Inc.: *See—*
Dahl, Nils J., 3,749,236.

Cseh, Ferenc. Internal combustion engine. 3,749,066, Cl. 123-65.00s.

CTS Corporation: *See—*
Miller, Jack L., 3,750,081.

Cucchiara, Alfred L. Sequentially dispensing syringe with multiple needle assembly. 3,749,084, Cl. 128-2.00f.

Cuevas, Ephraim A., to PPG Industries, Inc. Method of producing tetraalkylleads. 3,749,557, Cl. 23-297.000.

Cunningham, Byron H. Variable length V belt. 3,748,699, Cl. 24-38.000.

Curry, Samuel J.; and Reisenfeld, Sam, to Hughes Aircraft Company. System for minimizing upstream noise in a subscriber response cable television system. 3,750,022, Cl. 325-53.000.

Cutler-Hammer, Inc.: *See—*
Swessel, John A., Jr., 3,749,341.
Winter, Ronald C.; and Knief, Enno A., 3,748,915.

D Research & Development Company Limited: *See—*
Matthews, David Ernest, 3,749,534.

Daedalus Enterprises, Inc.: *See—*
Warner, Dwight Allen, 3,749,823.

Dahl, Nils J., to Crystal Thermoplastics, Inc. Openable and closable package. 3,749,236, Cl. 206-45.340.

Dahlin, Ake Bertil Ingemar: *See—*
Lindeborg, David Georg; and Dahlin, Ake Bertil Ingemar, 3,749,267.

Dahms, Harald; Levy, Gabor B.; and Seltzer, David A., to Photovolt Corporation. Reagent composition for coulometric Karl Fischer titration. 3,749,659, Cl. 204-195.00t.

Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf, 3,749,124.
Lamm, Heinz, 3,749,074.
Rommelshausen, Gunter Worner, 3,749,215.

Daitoku, Koichi: *See—*
Kimura, Shuji; and Daitoku, Koichi, 3,748,986.

Dale Electronics, Inc.: *See—*
Michaelsen, Dwight W., 3,749,886.

Dalman, Austin Lewis. Dump box for chaff and the like. 3,749,445, Cl. 298-26.000.

Daly, Richard T.; Kaplan, Robert A.; and Cohen, Martin G., to Quantronix Corporation. Resonant acousto-optical device. 3,749,476, Cl. 350-161.000.

D'Amato, Salvatore: *See—*
Feinstein, Sumner Sheldon; Golner, Jerold Julius; D'Amato, Salvatore; and Trunk, Eugene John, 3,748,939.

D'Amato, Salvatore F.: *See—*
Gazzola, Ivaldo; D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,749,330.

Damratowski, Leonard P.: *See—*
Samurt, Norman A.; Geary, Carl H.; and Damratowski, Leonard P., 3,749,516.

Dan-Fire-Energy ved Mita Gudmand-Hoyer: *See—*
Gudmand-Hoyer, Mita Maria, 3,749,079.

Danel, Jacques. Extensible support frameworks for furniture, particularly display furniture. 3,749,251, Cl. 211-126.000.

Danfoss A/S: *See—*
Petersen, Poul; and Pedersen, Hans Kristian, 3,750,082.

Daniels, Stacy L.; and Graham, Joseph P., to Dow Chemical Company, The. Sludge filtration device. 3,749,110, Cl. 137-92.000.

Danly Machine Corporation: *See—*
Eineck, Mathew F.; and Mahorney, Kenneth R., 3,749,005.

Dapak Systems, Inc.: *See—*
Batchelder, John M.; and Griswold, Augustus W., 3,749,631.

Dare Products, Inc.: *See—*
Wilson, Robert M., 3,749,819.

Dart Industries Inc.: *See—*
Prussi2, Samuel; and Mason, Jimmie L., 3,749,291.
Sweet, James B., 3,749,001.

Databit Incorporated: *See—*
Cohen, Peter J.; and Ackerman, Philip W., 3,749,841.

Davenport, Donald Ray: *See—*
Williams, Arthur; and Davenport, Donald Ray, 3,749,340.

Davidson, William M. Underwater release device. 3,749,933, Cl. 307-116.000.

Davies, Norman, to Westinghouse Electric Corporation. Detachable clamping electrical connector. 3,749,861, Cl. 200-48.000.

Davis, Leonard M., Jr.: *See—*
Johnson, William R., Jr.; and Davis, Leonard M., Jr., 3,749,685.

Davis, Paul, to Sweetheart Plastics, Inc. Container and closure. 3,749,276, Cl. 220-60.00r.

Davis, Richard L.: *See—*
Buscher, Richard G.; and Davis, Richard L., 3,748,749.

Davison, Gerald M. Combination air heating and cooling apparatus for limited space installations. 3,749,157, Cl. 165-48.000.

Dawson, Robert Herman, to RCA Corporation. High frequency insulated gate field effect transistor for wide frequency band operation. 3,749,985, Cl. 317-235.00r.

Day, Edward G., to General Motors Corporation. Reactor air flow control valve. 3,748,855, Cl. 60-290.000.

Day, Edward G.; and Giannone, Guy E., to General Motors Corporation. Sensor and trigger mechanism. 3,749,282, Cl. 222-5.000.

DBM Industries, Limited: *See—*
Muri, George, 3,748,940.

De Baan, Johannes Jasper; and Adrian, Adolf, to Belstein, August, Firma. Shock absorber. 3,749,210, Cl. 188-298.000.

De Baun, Kenneth W., to Air Monitor Corporation. Air flow balancing device. 3,748,901, Cl. 73-212.000.

de Bennetot, Michel Cotton, to Agence Nationale de Valorisation de la Recherche. Apparatus for intracorporeal control, in particular of the cross-section of an organic vessel or duct. 3,749,098, Cl. 128-346.000.

De Caro, Charles J., to Textron, Inc. Tire stud. 3,749,146, Cl. 152-210.000.

De Haes, Louis Maria, to Agfa-Gevaert N.V. Silver complex diffusion transfer process. 3,749,912, Cl. 250-323.000.

De Jule, Michael C., to Zenith Radio Corporation. Image display panel. 3,749,972, Cl. 315-169.0tv.

De Mestral, George, to Velcro S.A. Adhesive element in cloth form. 3,748,701, Cl. 24-204.000.

De Rossi, Mario, to Consiglio Nazionale delle Richerche. Reversible cell having a solid electrolyte and a silver anode. 3,749,606, Cl. 136-83.00r.

De Shazor, James C. Pipe cutting and forming tool. 3,748,933, Cl. 82-4.00c.

De Vries, Louis, to Chevron Research Company. Lubricating Oil additives. 3,749,695, Cl. 252-47.500.

De Witt, David A.: *See—*
De Witt, Ralph W.; and De Witt, David A., 3,749,480.

De Witt, Ralph W.; and De Witt, David A. Mirror rotation correction system. 3,749,480, Cl. 350-289.000.

Dean, Frank J., Jr.; and Reese, James A., to Tempmaster Corporation. Acoustical insulated fan and temperature conditioning penthouse unit. 3,748,997, Cl. 98-33.000.

Dean, Warren E.; and Dorsett, Charles M., to PPG Industries, Inc. Process for the recovery of mercury from aqueous solution. 3,749,761, Cl. 423-562.000.

Deaton, Felix W.; deceased (by Deaton, Felix W., Mrs.; spouse), to Cortez, Al, Sr. Embalmer's headrest. 3,748,705, Cl. 27-21.000.

Deaton, Felix W., Mrs.: *See—*
Deaton, Felix W., 3,748,705.

Debaigt, Jean, to Compagnie Generale d'Entreprises Electriques. Modular device for electrical connections and applications thereof. 3,750,093, Cl. 339-205.000.

Debry, Maurice E. Machine for the automatic continuous manufacture of reinforcements. 3,749,140, Cl. 140-71.00r.

Deere & Company: *See—*
Cayton, David Walter; and Johnson, Leslie William, 3,749,035.

DeGeorge Ceilings, Inc.: *See—*
DeGeorge, Philip, 3,748,804.

DeGeorge, Philip, to DeGeorge Ceilings, Inc. Suspended ceiling system. 3,748,804, Cl. 52-484.000.

Deines, Donald E., to Deines-Baker Development Co. Accumulator and boxer for flexible bags. 3,748,797, Cl. 53-124.00d.

Deines-Baker Development Co.: *See—*
Deines, Donald E., 3,748,797.

Delaval Turbine Inc.: *See—*
Tice, Charles, 3,749,864.

Dence, Donald Spencer, to Clark Equipment Company. Self-energized disc brake mechanism. 3,749,206, Cl. 188-72.200.

Denherder, Gerald, to National Poultry Equipment Co.; division of Dawson & Co., Inc. Automatic egg receiving and positioning machine to orientate eggs for vacuum lift placement in containers. 3,749,227, Cl. 198-33.0aa.

Denki Onkyo Co., Ltd.: *See—*
Nishiba, Seishiro, 3,750,077.

Denki Onkyo Company, Ltd.: *See—*
Kawada, Takehiko; and Takahashi, Hiroaki, 3,749,947.

Dentsply International Inc.: *See—*
Folkenroth, Richard P.; and Mader, William G., 3,749,371.

Deolorme, John H., to A. B. Dick Company. Exposure control in electrostatic photocopying processes. 3,749,488, Cl. 355-3.000.

Derdzinski, Terrence E.; Finger, Carl; and Geradi, Frank R., to Motorola, Inc. Weathertight, vandal resistant protective enclosure for housing circuit apparatus in an otherwise exposed location. 3,749,982, Cl. 317-120.000.

Derr, Lloyd J. Ovulation monitor. 3,749,089, Cl. 128-2.10e.

Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedosey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich. Method of producing diamonds. 3,749,760, Cl. 423-46.000.

Deschenes, Roger, to Compagnie des Freins et Signaux Westinghouse. Variable load valve. 3,749,452, Cl. 303-22.00r.

DeSoto, Inc.: *See—*
Gaske, Joseph E.; and Ansel, Robert E., 3,749,592.

Detmann, Walter; Meid, Gerhard; and Simon, Klaus, to Kalle Aktiengesellschaft. Semi-conductor alternating current regulating means. 3,749,884, Cl. 219-501.000.

Dettke, Manfred; Ludwig, Rolf; and Riedel, Wolfgang. Method of electrodepositing gold alloys. 3,749,650, Cl. 204-44.000.

Deutsch, Benzion. Obstacle detection system. 3,749,197, Cl. 180-98.000.

Deutsch Fastener Corporation: *See—*
Gulistan, Bulent, 3,749,144.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Schwarze, Werner; and Weigert, Wolfgang, 3,749,565.

Diamanti, Enrico: *See—*
Cavazza, Claudio; Bianchi, Giancarlo Eletti; and Diamanti, Enrico, 3,749,712.

Dick, A. B., Company: *See—*
Ormsbee, Mary K.; Saadeh, Mouin I.; and Skulby, Leonard, 3,749,670.

Dick, Heinrich: *See—*
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, 3,749,209.

Dickinson, Bryan J., to FMC Corporation. Fill passage oil strainer. 3,749,248, Cl. 210-238.000.

Diekhoff, Hans H.: *See—*
Smith, George L., Jr.; and Diekhoff, Hans H., 3,749,275.

Diekman, John D., to Zoecon Corporation. 5-Ethers of 1,3-benzoxathiol-2-one. 3,749,736, Cl. 260-327.00m.

Diepart, Paul; Gransart, Philippe; and Maitrias, Gerard, to Burroughs Corporation. Keyboard strobe filter for static keyboards. 3,749,940, Cl. 307-247.00a.

Dietrich, Johannes: *See—*
Beckmann, Gunter; Dietrich, Johannes; and Pfeiffer, Kurt, 3,749,555.

Dill, Hans G. Three-phase rotating ring display. 3,750,151, Cl. 340-379.000.

Dillenschneider, Jean-Paul, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Nickel-coated steel core wires and cables. 3,749,558, Cl. 29-191.600.

Director of National Research Institute for Metals, The: *See—*
Hasui, Atsushi, 3,749,298.

Distefano, Anthony J.: *See—*
Gero, Gabriel, 3,749,234.

Distefano, Domenik W.: *See—*
Gero, Gabriel, 3,749,234.

Dittmar, Armin: *See—*
Bulian, Walter; and Dittmar, Armin, 3,748,827.

Dockner, Toni: *See—*
Merger, Franz; Fuchs, Werner; and Dockner, Toni, 3,749,749.

Dodds, Robert M.: *See—*
Lorenzi, Silvio J.; Dodds, Robert M.; and Gunnill, Edward F., 3,748,794.

Dodsworth, Alfred Manston Heeley, to Clarkson, W. J., Limited. Material folding and stitching aid. 3,749,038, Cl. 112-121.150.

Dolamore, Charles D., to Lorain Products Corporation. Signal generator for telephone systems. 3,749,941, Cl. 307-271.000.

Donaldson, Leslie W. Incontinent appliance. 3,749,096, Cl. 128-295.000.

Dorbitz, Gunter, to Dragerwerk Aktiengesellschaft. Apparatus for mixing pressure gases particularly for respirators and medical devices. 3,749,111, Cl. 137-100.000.

Dore, James E.; and Mc Nutt, Charles R., to Olin Corporation. Direct chill casting mold manifold apparatus. 3,749,152, Cl. 164-283.000.

Dorsett, Charles M.: *See—*
Dean, Warren E.; and Dorsett, Charles M., 3,749,761.

Dorsey, Edward G., Jr.; Peterson, John A.; and Lund, Robert K., to Thiokol Chemical Corporation. Gun ammunition composed of encapsulated monopropellants. 3,749,615, Cl. 149-6.000.

Dortenzu, Alexander I.; and Sczerba, Stanley T., to Pennsylvania Engineering Corporation. Gas handling system for metallurgical vessels. 3,749,116, Cl. 137-255.000.

Dorton, Howard E. Bag strip for handling soiled surgical sponges. 3,749,237, Cl. 206-57.00a.

Doty, John T. Trenching machine. 3,749,446, Cl. 299-37.000.

Doughty, James A. Electronic musical tone modifier for musical instruments. 3,749,837, Cl. 179-1.000.

Douglas, Livingston C., to Colgate-Palmolive Company. Actuator cap with actuation disabling means. 3,749,286, Cl. 222-153.000.

Douglas-Hamilton, Diarmaid H.; and Pugh, Evan R., to Avco Corporation. Electron beam discharge device. 3,749,967, Cl. 315-85.000.

Dove, J. B., Inc.: *See—*
Chant, Albert H., Jr., 3,748,825.

Dow, Alden B. Choreographic musical and/or luminescent appliance. 3,749,810, Cl. 84-1.240.

Dow Chemical Company, The: *See—*
Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., 3,749,764.
Bergman, Sylvester, 3,749,599.
Bergman, Sylvester; and Pews, Richard Garth, 3,749,600.
Daniels, Stacy L.; and Graham, Joseph P., 3,749,110.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,737.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,738.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,739.
Hill, Donald G.; Smith, Charles F.; and Kucere, Clare H., 3,749,173.
Stringham, Robert R.; and Taplin, William H., III, 3,749,603.
Tomalia, Donald A.; and Paige, Janet N., 3,749,683.

Dowley, Mark W.; Mefferd, Wayne S.; and Rorden, Robert J. Laser trimming tool. 3,750,049, Cl. 331-94.500.

Downes, George R., Jr.; Brewer, Stanley F.; and Murtha, James E., to United States of America, Army. High efficiency constant voltage to constant current converter for energy storage. 3,750,005, Cl. 321-18.000.

Downey, Rogers B., to Polaroid Corporation. Apparatus for folding and ejecting a photographic cassette. 3,748,988, Cl. 242-198.000.

Doyel, John S. Hand weaving device. 3,748,706, Cl. 28-15.000.

Drabowitch, Serge, to Thomson-CSF. Multimode antenna system. 3,750,183, Cl. 343-786.000.

Draegert, David Allison, to Bell Telephone Laboratories, Incorporated. Logitudinal mode stabilization in lasers. 3,750,045, Cl. 331-94.50c.

Dragerwerk Aktiengesellschaft: *See—*
Dorbitz, Gunter, 3,749,111.

Dravo Corporation: *See—*
Lombardi, Raymond P., 3,749,533.

Dreger, Geoffrey, to Robertson, P. L., Manufacturing Company, Limited. Thread system. 3,748,949, Cl. 85-46.000.

Dresser Industries, Inc.: *See—*
Amador, German, 3,749,530.
Cope, Geoffrey Wilton, 3,749,255.
Montesi, Robert Paul, 3,749,359.

Drew, John L. Safety equipment for rescue workers, traffic policemen and the like. 3,749,902, Cl. 240-6.40w.

Driver, Wilbur B., Company: *See—*
Starr, Carrol Dean; Steinitz, Robert; and Wang, Teh Po, 3,749,569.

Drury, Harvey J.: *See—*
Schweitzer, Robert W.; and Drury, Harvey J., 3,748,708.

DSO "Cherna Metalurgia i Rudodobiv: *See—*
Lambev, Yordan Gueorguiev, 3,748,920.

Du Pont de Nemours, E. I., and Company: *See—*
Boetller, Albert J.; Clarke, Allan M.; and Wheatley, Roger W., 3,749,648.
Golton, William C.; and Rutkiewic, Andrew F., 3,749,672.
Lee, Jerald D., 3,749,926.
Pacofsky, Edward Anthony, 3,748,844.
Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., 3,749,637.

Du-Wel Metal Products, Inc.: *See—*
Foster, Edwin T., 3,748,791.

Duchemin, Michel, to Ressorts Du Nord S.A. Leaf spring having an improved fastening clip. 3,749,389, Cl. 267-52.000.

Duerr, Wolfgang F. Tooth brush-retractable pen. 3,749,503, Cl. 401-195.000.

Duff, Joseph Howard; and Smith, Paul Joseph. Paper perforating device. 3,748,737, Cl. 30-358.000.

Dufton, John Peter, to GTE Automatic Electric Laboratories Incorporated. Stored program small exchange with registers and senders. 3,749,844, Cl. 179-18.0es.

Dumitrescu, Constantin: *See—*
Constantinescu, Petre; Popescu, Mihail; and Dumitrescu, Constantin, 3,748,801.

Duncan, Robert C., to Procter & Gamble Company, The. Tampon with string attached to its proximal end. 3,749,094, Cl. 128-285.000.

Dunlop Holdings Limited: *See—*
Hart, Claude A.; and Haycock, Eric W., 3,749,145.

Dunn, Anthony Kenneth: *See—*
Sachs, George; Dunn, Anthony Kenneth; and Skuce, William Frederick, 3,748,745.

Dunn, James G.; and Cowan, John R., to International Telephone and Telegraph Corporation. Narrow band digital speech communication system. 3,750,024, Cl. 325-38.00b.

Dupler, Anna Gertrude Cooley: *See—*
Dupler, Raymond R.; and Dupler, Anna Gertrude Cooley, 3,749,078.

Dupler, Raymond R.; deceased; and Dupler, Anna Gertrude Cooley; executrix. Space heater. 3,749,078, Cl. 126-121.000.

Dupuis, Jean M., to Microsystems International Limited. Method and apparatus for manufacture of integrated circuit devices. 3,748,725, Cl. 29-577.000.

Durand, Pierre: *See—*
Rousselet, Andre; and Durand, Pierre, 3,748,911.

Duro-Test Corporation: *See—*
Emidy, Thomas J.; Northrop, Donald P.; Thorington, Luke; and Olsen, Andrew Henry, 3,749,467.

Dusault, Raymond A., Jr.; and Fasulo, Frank R. Security lock. 3,748,882, Cl. 70-416.000.

Dusenbery, John F. Apparatus for winding thin film into a roll. 3,749,328, Cl. 242-67.100.

Dusmet, Giacomo. Inflatable boat cover, for pneumatic boats, suitable to allow the boat to be towed in its capsized position. 3,748,671, Cl. 9-2.00a.

Eakins, Kenneth E., to Allergan Pharmaceuticals, Inc. Method for blocking prostaglandin activity. 3,749,776, Cl. 424-203.000.

Eames, Loren W.: *See—*
Berg, Joseph A.; and Eames, Loren W., 3,749,442.

Eastman Kodak Company: *See—*
Barkey, Kenneth T., 3,749,697.
Beach, David E., 3,748,991.
Cochran, Todd Dresser, 3,748,974.

Galbreath, Paul J.; Spaller, Albert E.; and Stockbridge, Bruce W., 3,749,539.
Gibbons, Carl B., 3,749,632.
Hollister, Kenneth R.; and Perry, Ernest J., 3,749,577.
Loose, Guenther H., 3,749,006.
Loria, Anthony, 3,749,735.
Willis, Roland G.; and Wabnitz, Herbert E., Jr., 3,749,572.

Eastwood, Fred: *See—*
Jago, Edward John; Eastwood, Fred; and Todish, W. Donald, 3,749,148.

Eaton Corporation: *See—*
Balzano, Alfiero F.; and Regan, John F., 3,748,878.
Balzano, Alfiero F., 3,749,435.
Chute, Richard, 3,749,513.
Jaeschke, Ralph L.; Moyer, William H.; and Wiltsey, Howard E., 3,749,216.
Kaiser, Hermann, 3,749,863.
Leichliter, Wayne K., 3,749,214.
Leimbach, Richard C., 3,749,360.
Vegners, Edgar Z., 3,749,195.

Ebauches S.A.: *See—*
Laessar, Claude; and Lambert, Robert, 3,748,848.

Eberly, Paul E., Jr., to Esso Research and Engineering Company. Hydroisomerization process with hydrogen faujacite containing a group VIII metal. 3,749,754, Cl. 260-683.680.

Ebisawa, Masaaki: *See—*
Sakita, Takashi; Ebisawa, Masaaki; and Mimoto, Hiroshi, 3,749,581.

Ebnother, Anton: *See—*
Bastian, Jean-Michel; Ebnother, Anton; and Rissi, Erwin, 3,749,729.

Eby, Robert J.: *See—*
United States of America, National Aeronautics and Space Administration, 3,749,156.

Echterling, Eugene J.: *See—*
Adickes, Cecil F.; Beaubien, Thomas S.; Weir, George R.; and Echterling, Eugene J., 3,749,402.

Ecodyne Cooling Products Company: *See—*
Burlong, Donn B.; and Luzaich, Samuel, 3,749,381.

Ecodyne Corporation, mesne: *See—*
Ryan, Leo F., 3,749,249.

Edele, Reinhard; Bauer, Kurt; and Roth, Christian, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Windscreen wiper arm for motor vehicles. 3,748,685, Cl. 15-250.350.

Edgar, Richard H., to Raytheon Company. Microwave applicator. 3,749,874, Cl. 219-10.550.

Edsall, Bruce M., to General Motors Corporation. Vehicle brake system. 3,749,451, Cl. 303-6.00c.

Edwards, Derek Reginald: *See—*
Reynolds, Edward Henry; and Edwards, Derek Reginald, 3,749,812.

Egawa, Hitoshi: *See—*
Matuzaki, Tetuo; Nakamura, Toshio; and Egawa, Hitoshi, 3,749,459.

Ehnert, Richard E.: *See—*
Stovers, Bessie T.; and Ehnert, Richard E., 3,749,281.

Ehrlichmann, Merlin W.; and Bjorklund, John R., Jr., to West Creek Co., Inc. Smoke control device. 3,749,032, Cl. 110-8.00a.

Eichman, Martin L.: *See—*
Ninger, Fred C.; and Eichman, Martin L., 3,749,773.

Eineck, Mathew F.; and Mahorney, Kenneth R., to Danly Machine Corporation. Electrical control system for a power press. 3,749,005, Cl. 100-53.000.

Eishman, Iosif David-Yankelevich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Eisner, Steve, to Norton Company. Crack-free hard chrome. 3,749,652, Cl. 204-105.00r.

Electronic Removal of Metals, Inc.: *See—*
Lobur, Walter, 3,749,877.

Eley, Edgar R., to Westinghouse Electric Corporation. Stress relieving member for encapsulated transformer windings. 3,750,071, Cl. 336-84.000.

Ellenberger & Poensgen GmbH: *See—*
Ellenberger, Jakob, 3,750,074.

Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Plunger type relay. 3,750,074, Cl. 337-77.000.

Ellies, Alan David; and Cone, Richard E., II. Interlockable sticks for confections. 3,748,778, Cl. 46-28.000.

Ellis, Alfred Brian Edwin, to Marconi Company, Limited, The. System for processing slope and duration information, contained in complex waveforms. 3,749,834, Cl. 178-66.000.

Ellis, Donovan Russell, Jr.; and Markiewicz, Bernard Frank, to Becton, Dickinson and Company. Resealable ampoule closure. 3,749,271, Cl. 215-32.000.

Ellman, George L.: *See—*
Hegeman, George D.; and Ellman, George L., 3,749,643.

Ellner, Edwin, to Better Packages, Inc. Strip material dispenser feed-out control. 3,749,013, Cl. 101-227.000.

Elsner, Uwe; and Komossa, Werner, to Hauni-Werke Korber & Co., KG. Apparatus for sharpening rotary cutters for tobacco or the like. 3,748,786, Cl. 51-5.000.

Ely, William G.; and Sinclair, John C., to Zenith Radio Corporation. Hearing aid with directional microphone system. 3,749,853, Cl. 179-107.00h.

Elzinga, Johannes Mattheus, to U.S. Philips Corporation. Keyboard with roll-over feature. 3,750,160, Cl. 340-365.00e.

Emerson Electric Co.: *See—*
Hines, Burgess W., 3,750,076.
Kieffer, Vernon E., 3,748,714.
Love, John J.; and Smith, Carl A., 3,749,120.
Vodvarka, Richard T.; and Kozbelt, Lloyd S., 3,749,883.

Emery Industries, Inc.: *See—*
Boehringer, Raymond H.; and Vail, Robert E., 3,749,702.
Kammann, Karl P., Jr., 3,749,745.

Emhart Corporation: *See—*
Barton, Bruce H., 3,748,972.

Emidy, Thomas J.; Northrop, Donald P.; Thorington, Luke; and Olsen, Andrew Henry, to Duro-Test Corporation. Fluorescent lamps and method of manufacturing the same. 3,749,467, Cl. 316-19.000.

Emmons Guitar Company, Inc.: *See—*
Lashley, Ronald T., 3,748,943.

Endo, Masanori: *See—*
Kato, Umaki; Endo, Masanori; and Kamata, Katsuo, 3,750,064.

Endow, John S.: *See—*
Halpern, Samuel E.; Tubis, Manuel; and Endow, John S., 3,749,913.

Engelbart, Wilhelm, to Hoffman Rheem Maschinen GmbH. Ironing press, in particular for jackets and the like. 3,749,292, Cl. 223-57.000.

Engeler, Karl, to Inventio Aktiengesellschaft. Handrail drive arrangement for escalators and human conveyor bands. 3,749,224, Cl. 198-16.000.

Engelhard, Helmut; Bentz, Francis; Brokmeier, Dieter; and Nischk, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Acrylonitrile copolymers. 3,749,701, Cl. 260-80.720.

Engelhorn, Robert: *See—*
Schmidt, Gunther; Engelhorn, Robert; and Leitold, Matyas, 3,749,785.

Entoleter, Inc.: *See—*
Reynolds, Donald R., 3,749,322.

Entreprise de Recherches et d'Activites Petrolieres Elf: *See—*
Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, 3,748,826.

Epsilon S.A.: *See—*
Langer, Robert Marie Gerard; and Babon, Paulette Aimee, 3,749,320.

Epsztein, Bernard, to Thomson-CSF. High frequency electronic devices. 3,750,043, Cl. 330-43.000.

Erickson, Lloyd A., to Illinois Tool Works Inc. Key ejector lock. 3,748,881, Cl. 70-388.000.

Erlichman, Irving. Polaroid Corporation Photographic apparatus. 3,748,990, Cl. 95-30.000.

Erling, John. Flower protector. 3,748,781, Cl. 47-34.110.

ESB Incorporated: *See—*
Peters, Randall W., 3,749,605.
Walker, Loren H., 3,750,004.

Eskridge, Marshall: *See—*
Willson, James K. V.; and Eskridge, Marshall, 3,749,085.

Esser, Klaus; Schurmann, Helmut; Heitner, Alfred; and Hildebrandt, Norbert, to Esser, Klaus, KG. Mounting rims. 3,749,908, Cl. 240-78.00h.

Esser, Klaus, KG: *See—*
Esser, Klaus; Schurmann, Helmut; Heitner, Alfred; and Hildebrandt, Norbert, 3,749,908.

Esso Research and Engineering Company: *See—*
Eberly, Paul E., Jr., 3,749,754.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bogaut, Andree; and Estradier, Francoise, 3,749,716.

Ethyl Corporation: *See—*
Perilstein, Warren L., 3,749,560.

Evans, Gary E., to Westinghouse Electric Corporation. Dipole antenna array. 3,750,185, Cl. 343-814.000.

Everett, Lawrence H.: *See—*
Billerbeck, Fred W.; Everett, Lawrence H.; and Ritsema, Craig T., 3,749,587.

Everitt, Scott F.; Croup, Robert E.; and Strawn, Alvin A., to Acoustic Fiber Sound Systems, Inc. Sound reproduction system. 3,749,198, Cl. 181-31.00b.

Expo Nord AB: *See—*
Persson, Eric Sigfrid; and Persson-Melin, Signe Harriet, 3,749,444.

Fabrique de Machines Andre Bechler S.A.: *See—*
Poget, Rene, 3,748,866.

Falk, Richard A. Device for taking a molten sample. 3,748,908, Cl. 73-354.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. Substituted cinnamyl thiocyanates and their isomers. 3,749,747, Cl. 260-454.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. Insecticidal 2-aminothiazole phosphates and phosphonates. 3,749,775, Cl. 424-200.000.

Fannin, Eugene R.; and Gumbelevicius, John, to McDonnell Douglas Corporation. Process and solution for removing titanium and refractory metals and their alloys from tools. 3,749,618, Cl. 156-3.000.

Farbenfabriken Bayer Aktiengesellschaft: *See*—
Engelhard, Helmut; Bentz, Francis; Brokmeier, Dieter; and Nischk, Gunther, 3,749,701.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
Fuchs, Otto; and Spietschka, Ernst, 3,749,726.
Fuchs, Otto; and Troster, Helmut, 3,749,727.
Geiger, Rolf; and Schroder, Hans-Georg, 3,749,704.
Geiger, Rolf; Wissmann, Hans; Konig, Wolfgang; and Azadian, Genevieve, nee Boulanger, 3,749,706.
Schleyerbach, Rudolf; and Geiger, Rolf, 3,749,774.
Schoor, Manfred; Schrinner, Elmar; and Schutze, Eberhard, 3,749,711.

Faris, William R., to Bendix Corporation, The. Diplexed multi-frequency CW doppler radar. 3,750,171, Cl. 343-9.000.

Farmland Industries, Inc.: *See*—
Kreps, Robert W., 3,750,011.

Farrell, Robert C.; Skelley, John W.; Milton, Thomas J.; and Piziks, Henry I., to General Motors Corporation. Transmission shift control. 3,748,921, Cl. 74-484.000.

Farrell, Robert C., to General Motors Corporation. Energy absorbing steering column. 3,748,922, Cl. 74-492.000.

Fasulo, Frank R.: *See*—
Dusault, Raymond A., Jr.; and Fasulo, Frank R., 3,748,882.

Fauquembergue, Jean G.; Lingrand, Michel; Peltier, Henri; and Chatourel, Pierre, to Regie Nationale des Usines Renault. Centrifugal casting apparatus with chill mold holding furnace. 3,749,153, Cl. 164-295.000.

Faust, Eberhard: *See*—
Strien, Werner; Faust, Eberhard; and Walz, Jurgen, 3,749,443.

Fay, Richard J.: *See*—
United States of America, National Aeronautics and Space Administration, 3,749,205.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Magnetic electric connector. 3,750,083, Cl. 339-12.00r.

Fedor, Richard M.; and Podo, Russell B. Occupant propelled roundabout devices. 3,749,399, Cl. 272-33.00a.

Fedossey, Dmitry Valerianovich: *See*—
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

FEI, Inc., mesne: *See*—
Snowden, Bryan T., 3,748,691.

Feinstein, Sumner Sheldon; Golner, Jerold Julius; D'Amato, Salvatore; and Trunk, Eugene John, to Borden, Inc. Traversing film cutter. 3,748,939, Cl. 84-370.000.

Fellers, Rufus Gustavus; and Hinderks, Larry Wardell, to Bell Telephone Laboratories, Incorporated. Fault locating system for waveguide transmission line utilizing spaced reflectors. 3,750,012, Cl. 324-52.000.

Ferguson, Robert E., to Coachmen Industries, Inc. Device for raising and lowering the tops of convertible recreational vehicles. 3,749,439, Cl. 296-26.000.

Fernandes, Joseph F.; Pfouts, Robert R.; and Lord, Thomas J., to United Aircraft Products, Inc. By-pass control mechanism. 3,749,308, Cl. 226-93.000.

Ferranti Limited: *See*—
Martin, John Terry; Remmington, John Elstow; and Bedford, John, 3,750,110.

Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Pumping apparatus with two separated fluid systems. 3,749,526, Cl. 417-390.000.

Fest, Christa; Hammann, Ingeborg; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. Pyridazinothi onophosphoric(phosphonic)acid esters. 3,749,720, Cl. 260-250.00a.

Fetzer, Gustav, to Zinser-Textilmachinen GmbH. Electromagnetic brake incorporated in spinning or twisting spindles. 3,749,955, Cl. 310-93.000.

Fiat Societa per Azioni: *See*—
Peruglia, Marco; and Anselmino, Giovanni, 3,749,125.

Fidler, Robert Charles, to McCulloch Corporation. Starter spring assembly tool and method. 3,748,716, Cl. 29-228.000.

Fieldcrest Mills, Inc.: *See*—
Lawson, Lonnie Gravely, 3,748,843.

Filachione, Edward M.: *See*—
Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., 3,749,669.

Finger, Carl: *See*—
Derdzinski, Terrence E.; Finger, Carl; and Geradi, Frank R., 3,749,982.

Firestone Tire & Rubber Company, The: *See*—
McCarty, John R., 3,750,120.

Fischer, Paul W.; Maly, George P.; and Pyle, Delbert E., to Union Oil Company of California. Method for reducing erosion and corrosion of metal surfaces. 3,749,554, Cl. 21-2.50r.

Fisen, Stefan. Surgical knife. 3,748,736, Cl. 30-151.000.

Fisher, Michael H., to Merck & Co., Inc. Anthelmintic compositions containing benzimidazoles and method of use. 3,749,789, Cl. 424-273.000.

Fitzmayer, Louis H.; and Worden, Nelson B., to General Electric Company. Microwave oven leakage detection system. 3,749,875, Cl. 219-10.550.

Five Star Engineering, Inc.: *See*—
Keyser, Merle D.; and Jones, Howard R., Jr., 3,749,177.

Fleischer, John M., to International Business Machines Corporation. Light scanning and printing system. 3,750,189, Cl. 346-74.0es.

Fleissner, Heinz, to Vepa AG. Process and apparatus for the treatment of material lengths. 3,748,747, Cl. 34-122.000.

Fluor Cooling Products Company: *See*—
Furlong, Donn B.; and Ovard, John C., 3,748,832.

Fluorodynamics, Inc.: *See*—
Shoffner, James P., 3,749,621.

FMC Corporation: *See*—
Abbott, John A.; and Watson, Clyde D., 3,749,103.
Craig, Fred A., 3,748,785.
Dickinson, Bryan J., 3,749,248.

Foard, James H., Jr.: *See*—
Bartram, Nial; and Foard, James H., Jr., 3,748,730.

Folkenroth, Richard P.; and Mader, William G., to Dentsply International Inc. Dental material mixer. 3,749,371, Cl. 259-72.000.

Foote, Chauncey P., Jr.: *See*—
Gazzola, Ivaldo; D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,749,330.

Ford, Richard T., to United States of America, Navy. Semiconductor electromagnetic radiation isolated thermocouple. 3,748,904, Cl. 73-359.000.

Fornasiero, Paolo; and Tomasi, Sergio, to Societa Italiana Telecomunicazioni Siemens S.p.A. TDM telecommunication system for transmitting data or telegraphic signals. 3,749,839, Cl. 179-15.0by.

Fornasiero, Paolo; and Tomasi, Sergio, to Societa Italiana Telecomunicazioni Siemens S.p.A. TDM telecommunication system designed for transmission of supervisory signals. 3,749,840, Cl. 179-15.0by.

Fortuna-Werke Maschinenfabrik AG: *See*—
Koppenwallner, Georg, 3,748,788.

Foseco International Limited: *See*—
Jago, Edward John; Eastwood, Fred; and Todish, W. Donald, 3,749,148.

Foseco Trading A.G.: *See*—
Nangarrow, John; Jones, Paul Victor; and Clark, Peter Stanley, 3,749,628.

Foster, Edwin T., to Du-Wel Metal Products, Inc. Method of making finished metal die castings. 3,748,791, Cl. 51-323.000.

Foster, Eric, to Sumlock Anita Electronics Limited. Switch mounted on printed circuit board. 3,749,872, Cl. 200-66.0pc.

Foster, John A., to Clark, J. L., Manufacturing Co. Child-proof pill box. 3,749,230, Cl. 206-1.500.

Foucry, Jean; and Auriol, Alain, to Ceraver. Method for making anhydrous chromium sesquioxide by reducing a hexavalent chromium compound. 3,749,595, Cl. 117-119.600.

Fountain, Roger; and McLaughlin, Gregory M., to McDonnell Douglas Corporation. Method of bonding silicone rubbers to organic rubbers and composite object. 3,749,617, Cl. 156-3.000.

Fouquet-Werk Frauz & Planck: *See*—
Linka, Adolf, 3,749,135.

Foury, Georges, to Compagnie Generale d'Automatisme. Method for transferring a load from a first support to a second support. 3,749,263, Cl. 214-152.000.

Fowler, James M., to ACF Industries, Incorporated. Valve structure having fluid pressure actuated seats. 3,749,357, Cl. 251-172.000.

Fowler, Raymond L.; and Heard, Roderick S., to International Business Machines Corporation. Selection system. 3,748,976, Cl. 95-4.500.

Fox, Anthony. Trash compactor with lifter. 3,748,820, Cl. 53-124.00b.

Foxboro Company, The: *See*—
Karas, Edwin L.; Lee, Davis S.; and Vanslette, Robert A., 3,748,833.

Fraleigh, Marion Foster; and Wise, Raleigh Warren, to Monsanto Company. Apparatus and method for making cable bead. 3,748,841, Cl. 57-21.000.

Franaques, Howard L., Jr.: *See*—
Addison, Frank E., 3,749,126.

Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., to Western Electric Company, Incorporated. Methods and apparatus for scrubbing thin, fragile slices of material. 3,748,677, Cl. 15-21.00d.

Frankenberg, Robert J., to Hewlett-Packard Company. Computer memory temperature compensation. 3,750,119, Cl. 340-174.0sc.

Frankewich, Peter A. Relief valve apparatus. 3,749,121, Cl. 137-512.200.

Franklin Mint Corporation: *See*—
Karawin, Kenneth J., 3,748,712.

Fransson, Goran E.: *See*—
Hiklert, Thomas L.; Fransson, Goran E.; and Trenbeath, Richard E., 3,748,962.

Frantz, Dale E.; and Shortlidge, Donlad L., to Schick, Incorporated. Control unit for electric shaver. 3,748,732, Cl. 30-43.100.

Fraser, Alexander Gibson, to Bell Telephone Laboratories, Incorporated. Digital data communication system. 3,749,845, Cl. 179-15.0al.

Fraser, Ronald E. Blackboard eraser. 3,748,684, Cl. 15-244.00r.

Frederickson, Arthur R.; Morris, Arnold D.; and Jackson, B. Walter, to United States of America, Air Force. Device to aid in centering of high energy electric particle beams in an evacuated drift tube. 3,749,963, Cl. 315-18.000.

Freed, Meier E.; and Childress, Scott J., to American Home Products Corporation. Substituted 3,3-diphenylpiperazines and 3,3-diphenylpiperazin-2-ones. 3,749,725, Cl. 260-268.00r.

Fregeolle, Oscar, to Pilot Research Corporation. Seamless knit lower body garment and method of making same. 3,748,870, Cl. 66-177.000.

Freiheit, Roger E. Melody chord constructor for string instruments. 3,748,947, Cl. 84-485.000.

Fremont Industries, Inc.: *See—*
Chang, Edward H., 3,749,675.

Freuhauf Corporation: *See—*
Loomis, Robert Jewelle; and Rensink, Chester William, 3,749,438.

Freyhold, Helmut V.; and Wehle, Volker. Readily-soluble, solid, water-containing alkali metal silicates and process. 3,749,759, Cl. 423-332.000.

Friedman, Aaron: *See—*
Friedman, Abraham; and Friedman, Aaron, 3,749,905.

Friedman, Abraham; and Friedman, Aaron. Rechargeable flashlight and support stand therefor. 3,749,905, Cl. 240-10.6ch.

Friedman, Mendel: *See—*
Koenig, Nathan H.; and Friedman, Mendel, 3,749,553.

Friedman, Robert H.; Krause, Julianne D.; and Bradford, William R., to Getty Oil Company. Method for selective plugging of wells. 3,749,174, Cl. 166-294.000.

Friemann & Wolf GmbH: *See—*
Weissenborn, Dieter; Bock, Ortwin; and Werding, Norbert, 3,750,023.

Fritts, Russell A., to Singer Company, The. Cassette threading arrangement in sewing machines. 3,749,039, Cl. 112-218.00r.

Froehlich, Alfred, to Ciba-Geigy AG. Silver halide photosensitive element containing hydrophilic colloid layers hardened with α~β-bis-acryloylamido-ethyleneglycol. 3,749,573, Cl. 96-50.00r.

Frunn, Klaus: *See—*
Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, 3,749,868.

Fuchs, Otto; and Spietschka, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Linear alkyl-amido trans-quinacridone pigments. 3,749,726, Cl. 260-279.00r.

Fuchs, Otto; and Troster, Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzoxanthene dyestuffs and process for their manufacture. 3,749,727, Cl. 260-281.000.

Fuchs, Werner: *See—*
Merger, Franz; Fuchs, Werner; and Dockner, Toni, 3,749,749.

Fuji Photo Film Co., Ltd.: *See—*
Kuwayama, Shigeo, 3,749,561.
Ohkubo, Kinji; and Kato, Kazunobu, 3,749,578.
Sato, Akira; Ikeda, Tadashi; Nakazawa, Yoshiyuki; and Takei, Haruo, 3,749,714.
Sato, Masamichi, 3,749,059.
Sato, Masamichi; Matsumoto, Seiji; Fukushima, Osamu; and Honjo, Satoru, 3,749,927.

Fujiki, Tokio: *See—*
Kosaka, Yojiro; Uemura, Masaru; and Fujiki, Tokio, 3,749,756.

Fujimoto, Kyohei; and Tamura, Katsuhiko, to Matsuchita Electric Industrial Co., Ltd. Magnetic antenna with time variation of core permeability. 3,750,180, Cl. 343-788.000.

Fujita, Atsushi; and Uchida, Teruhiko, to Tokyo Shibaura Electric Co., Ltd. Apparatus for piling up sheets. 3,749,398, Cl. 271-86.000.

Fukata, Masao. System for receiving one of particular control signals preceded by a common start signal under protection against static noise. 3,750,033, Cl. 325-478.000.

Fukushima, Osamu: *See—*
Sato, Masamichi; Matsumoto, Seiji; Fukushima, Osamu; and Honjo, Satoru, 3,749,927.

Fuller, Francis W.; and Kiwalle, Jozef, to Production Technology Inc. Method for flash removal. 3,748,719, Cl. 29-481.000.

Fulton, Thomas Philip, to RCA Corporation. Magnetic core memory plane construction. 3,750,118, Cl. 340-174.0ma.

Funck, Ronald, to Thomas-CSF. Integrated phase-shifting microcircuit. 3,750,055, Cl. 333-31.00r.

Funk, Joseph C., to Funk Mfg. Company. Yieldable support means and drive mechanism for concrete mixer drums. 3,749,372, Cl. 259-177.00r.

Funk Mfg. Company: *See—*
Funk, Joseph C., 3,749,372.

Fuqua, Lloyd T.; and Todd, Harold E., to General Motors Corporation. Miniature incadescent lamp having integral bulb and base. 3,749,960, Cl. 313-318.000.

Furbeck, Warren R.: *See—*
Lee, Charles A.; and Furbeck, Warren R., 3,749,624.

Furlong, Donn B.; and Ovard, John C., to Fluor Cooling Products Company. Drift eliminator. 3,748,832, Cl. 55-257.000.

Furuhata, Akio: *See—*
Yoshimura, Hirofumi; Takahata, Hisatoshi; Furuhata, Akio; and Nishimura, Susumu, 3,748,978.

G-L-J Toy Co., Inc.: *See—*
Greenwood, Donald, 3,749,482.

Gabryk, Stanislaw, 50% to Lee, Raymond, Organization, The. Radial flow inverted type steam turbine. 3,749,510, Cl. 415-103.000.

GAF Corporation: *See—*
Hoover, James Eugene; Houser, Robert Wilson; and Sheffer, Bernard Clifford, 3,748,715.

Gaffney, Bernard J.; and Larsen, Ronald L., to Conwed Corporation. Apparatus for extrusion of plastic net. 3,749,535, Cl. 425-150.000.

Gaines, Lewis H.: *See—*
Jasinski, Raymond J.; and Gaines, Lewis H., 3,749,607.

Galatioto, Santo C.: *See—*
Marcucci, Ronald R.; and Galatioto, Santo C., 3,750,034.

Galbarini, Masu; and Cotta Ramusino, Francesco, to Innocenti Societa; Generale per l'Industrie Metallurgica e Meccanica. Angularly adjustable attachment for a machine tool headstock. 3,748,965, Cl. 90-17.000.

Galbreath, Paul J.; Spaller, Albert E.; and Stockbridge, Bruce W., to Eastman Kodak Company. Underwater pelletizer die plate. 3,749,539, Cl. 425-313.000.

Gale, Mae: *See—*
Gale, Ronald, 3,749,280.

Gale, Ronald; deceased (by Gale, Mae; executrix), to Rowe International, Inc., mesne. Bulk loading can dispenser. 3,749,280, Cl. 221-67.000.

Gallagner, Hayden E., to Hughes Aircraft Company. Method and apparatus for offswitching crossed field switch. 3,749,978, Cl. 315-236.000.

Galli, Charles, to United Aircraft Corporation. Helicopter blade with universally replaceable pockets. 3,749,517, Cl. 416-226.000.

Gandolfi, Giovanni: *See—*
Placente, Luigi; and Gandolfi, Giovanni, 3,749,847.

Gannon, John Allister, to Ciga-Geigy Corporation. Polyester derived from dimethylol propionic acid in admixture with polyepoxides. 3,749,758, Cl. 260-835.000.

Gardner, Mervin Amos, to AMP Incorporated. High voltage electrical connector lead assembly. 3,750,084, Cl. 339-61.00r.

Garick, Bordie B. Method and apparatus for coating of filaments. 3,749,057, Cl. 118-420.000.

Garretson, Owen L. Process for filling liquefied gas vessels. 3,749,141, Cl. 141-5.000.

Garrett Corporation, The: *See—*
Hertzog, Heber T.; and Kamstra, Peter, 3,748,927.

Garside Corporation: *See—*
Seaton, William Joe, 3,750,162.

Gartmell, James V., to National Cash Register Company, The. Oriented light scattering display device. 3,749,474, Cl. 350-160.01c.

Gaske, Joseph E.; and Ansel, Robert E., to DeSoto, Inc. Radiation curing lacquers. 3,749,592, Cl. 117-62.000.

Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for rocket launchers. 3,748,955, Cl. 89-1.814.

Gates, Albert George Ronald, to Gestetner Limited. Printing machine blanket cylinder cleaning device. 3,749,014, Cl. 101-425.000.

Gauthier, William Kohlmann. Surgical retractor device. 3,749,088, Cl. 128-20.000.

Gaw Co., Inc.: *See—*
Gaw, Norman W., Jr., 3,750,014.

Gaw, Norman W., Jr., to Gaw Co., Inc. Frequency measuring apparatus. 3,750,014, Cl. 324-79.00d.

Gay, Michael J., to Motorola, Inc. Active bootstrap circuit. 3,750,041, Cl. 330-26.000.

Gayeski, Thomas Edward Joseph, to RCA Corporation. Redundant Fraunhofer recording system. 3,749,469, Cl. 350-3.500.

Gazzola, Ivaldo; D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., to American Bank Note Company. Apparatus for delivering sheets onto a moving strip of material. 3,749,330, Cl. 242-67.30r.

GCO, Inc.: *See—*
Brown, Gordon M.; and Porter, Kenneth R., 3,749,470.

Geary, Carl H.: *See—*
Samurt, Norman A.; Geary, Carl H.; and Damratowski, Leonard P., 3,749,516.

Gedge, Burton H., III, to Procter & Gamble Company, The. Process of producing enzyme compositions. 3,749,671, Cl. 252-89.000.

Gehman, John B.; Herlich, Gilbert A.; and Mikuteit, Seigfried, to General Dynamics Corporation. Postal tracking system. 3,750,167, Cl. 343-6.5ss.

Geiger, Gilbert W.: *See—*
Liss, Donald H.; and Geiger, Gilbert W., 3,749,461.

Geiger, Rolf: *See—*
Schleyerbach, Rudolf; and Geiger, Rolf, 3,749,774.

Geiger, Rolf; and Schroder, Hans-Georg, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. N-(ω-amino lower alkyl)-amides of 1,17-modified acth peptides. 3,749,704, Cl. 260-112.500.

Geiger, Rolf; Wissmann, Hans; Konig, Wolfgang; and Azadian, Genevieve, nee Boulanger, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Novel dipeptide amide and process for its manufacture. 3,749,706, Cl. 260-112.500.

Gelman Instrument Company: *See—*
Keefer, Richard D., 3,750,187.

General Computing Equipment Corporation: *See—*
Angus, David R.; and Smith-Vaniz, William Reid, 3,750,103.

General Dynamics Corporation: *See—*
Ayers, Weston D.; and Hirsch, Joseph G., 3,750,127.

Gehman, John B.; Herlich, Gilbert A.; and Mikuteit, Seigfried, 3,750,167.

General Electric Company: *See—*
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., 3,748,957.
Baumann, Frederick W.; and Rosenberry, George M., Jr., 3,749,953.
Baxter, Robert David, 3,749,980.
Brown, Dale H., 3,749,379.
Carlson, Gerald J.; and Summerhayes, Harry R., 3,749,500.
Chen, Arthur C. M.; and Wang, Jish-Min, 3,750,117.
Cooper, Glenn D., 3,749,693.
Fitzmayer, Louis H.; and Worden, Nelson B., 3,749,875.
Hildebrand, George L., 3,748,912.
Holub, Fred F., 3,749,722.
Jones, Robert M.; and Rowan, William I., 3,749,048.
Lamberi, Thomas W., 3,749,943.
Lenz, Henry George, 3,749,950.
Meeks, Frederick T., 3,749,880.
Mitchell, James W., 3,748,770.
Mosier, Richard C., 3,749,602.
Mundy, Joseph L., 3,750,115.
Nedreski, Robert Joseph, 3,749,329.
Nedreski, Robert Joseph, 3,749,331.
Peil, William; and McFadyen, Robert J., 3,750,042.
Stearns, Burdett Kinney; Graham, David Alan; Seemann, James Marion; and Zink, George, 3,748,958.
Waful, Lawrence F., 3,750,152.
Wilson, Arthur C., 3,749,081.
Worcester, Joseph A., 3,750,030.

General Foods Limited: *See—*
Rhodes, David, 3,749,378.

General Industries, Inc.: *See—*
Grenier, Wilfred J., 3,749,176.

General Motors Corporation: *See—*
Bandukwalla, Phiroze, 3,749,520.
Berg, Rober M., 3,749,625.
Cross, Norman A.; and Polak, James C., 3,748,924.
Day, Edward G., 3,748,855.
Day, Edward G.; and Giannone, Guy E., 3,749,282.
Edsall, Bruce M., 3,749,451.
Farrell, Robert C.; Skelley, John W.; Milton, Thomas J.; and Piziks, Henry I., 3,748,921.
Farrell, Robert C., 3,748,922.
Fuqua, Lloyd T.; and Todd, Harold E., 3,749,960.
George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., 3,749,151.
Green, Lawrence E., 3,748,929.
Gumbleton, James J.; and Kuehl, Paul B., 3,749,071.
Hause, Gilbert K., 3,748,851.
Hogan, Martin J., 3,749,460.
Jones, Trevor O., 3,749,918.
Lathers, Michael W., 3,749,440.
Pancy, Richard E., 3,749,418.
Sampatacos, Peter M., 3,749,415.
Schaefer, Robert H.; and Marlow, Jerry R., 3,748,931.
Walker, Frank H.; and Kantrud, Gary M., 3,749,531.

General Telephone Company of California: *See—*
Iversen, Ralph T., 3,750,086.

George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., to General Motors Corporation. Vibratory shakeout apparatus. 3,749,151, Cl. 164-260.000.

Georgia-Pacific Corporation: *See—*
Jespersen, Paul W., 3,748,693.

Geradi, Frank R.: *See—*
Derdzinski, Terrence E.; Finger, Carl; and Geradi, Frank R., 3,749,982.

Gerber Products Company: *See—*
Billerbeck, Fred W.; Everett, Lawrence H.; and Ritsema, Craig T., 3,749,587.

Gerhard, Albert, to Bosch, Robert, G.m.b.H. Battery connected dynamo electric machine system. 3,750,002, Cl. 320-61.000.

Gerich, Anton J., to Therm-O-Disc, Incorporated. Bimetallic snap disc and method and apparatus for making same. 3,748,888, Cl. 72-375.000.

Germershausen, Raimund, to Rheinmetall G.m.b.H. Detonation producing ammunition. 3,749,018, Cl. 102-33.000.

Gero, Andre: *See—*
Gero, Gabriel, 3,749,234.

Gero, Gabriel, 33 1/3% to Gero, Andre, 16 2/3% to Distefano, Anthony J. and 16 2/3% to Distefano, Domenik W. Cigarette dispensing package. 3,749,234, Cl. 206-41.20b.

Gestetner Limited: *See—*
Gates, Albert George Ronald, 3,749,014.

Getty Oil Company: *See—*
Friedman, Robert H.; Krause, Julianne D.; and Bradford, William R., 3,749,174.

Gevaert Photo-Production N.V.: *See—*
Vrancken, Marcel Nicolas; and Willens, Jozef Frans, 3,749,707.

Gevaert-Agfa N.V.: *See—*
Willems, Jozef Frans, 3,749,575.

Giambalvo, Vito Albert: *See—*
Thomas, Daniel Walter; and Giambalvo, Vito Albert, 3,749,590.

Giannone, Guy E.: *See—*
Day, Edward G.; and Giannone, Guy E., 3,749,282.

Gibbons, Carl B., to Eastman Kodak Company. Material edge detecting apparatus. 3,749,632, Cl. 156-364.000.

Giesecke, Albert S. Closed-open sign. 3,748,767, Cl. 40-65.000.

Gilmour, Alexander Scott, Jr.: *See—*
Rait, Joseph M.; Gilmour, Alexander Scott, Jr.; Sellers, Edward C.; and Lindberg, Edward, 3,749,833.

Gilson, Verle A., to United States of America, Atomic Energy Commission. Gas laser having excitation chambers with multiple channels. 3,750,047, Cl. 331-94.005.

Giraud, Francois L., to LTV Aerospace Corporation, mesne. Endless-chain conveyor, particularly for transporting independent cars. 3,749,025, Cl. 104-25.000.

Girling Limited: *See—*
Quiney, Kenneth Maurice, 3,748,913.

Giuliani, Robert L. Electric credit card system for use with cash register. 3,749,887, Cl. 235-61.70b.

Glass, Marvin, & Associates: *See—*
Glass, Marvin I.; Morrison, Howard J.; Nix, Donald F.; and Allen, Robert N., 3,748,780.

Glass, Marvin I.; Morrison, Howard J.; Nix, Donald F.; and Allen, Robert N., to Glass, Marvin, & Associates. Toy vehicle. 3,748,780, Cl. 46-202.000.

Glaverbel S.A.: *See—*
Brichard, Edgard, 3,749,564.

Glazkov, Vladimir Petrovich: *See—*
Obukhov, Vitaly Arsenievich; and Glazkov, Vladimir Petrovich, 3,749,957.

Glendinning Companies, Inc.: *See—*
McCormick, William J., Jr., 3,749,233.

Gley, Paul R., to Rex Chainbelt, Inc. Hood latch. 3,749,434, Cl. 292-128.000.

Glicksberg, Raymond Charles. Earthquake-insulation foundations. 3,748,800, Cl. 52-167.000.

Global Marine Inc., mesne: *See—*
Anders, Edward O., 3,749,162.
Koomey, Paul C.; Stivers, George S.; and Barker, Theodore R., II, 3,750,096.

Go-Craft Systems, Inc.: *See—*
Ow, Gordon Y. W., 3,749,046.

Godfrey, Charles S., to Physics International Company. Water cannon. 3,748,953, Cl. 89-1.000.

Goering, Ulrich: *See—*
Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, 3,749,868.

Goerner, Douglas C.: *See—*
Branham, Donald R.; Borg, Paul E.; and Goerner, Douglas C., 3,749,183.

Goforth, David Langston. Fishing lure. 3,748,773, Cl. 43-42.100.

Gold, Harold. System for installing fluid elements in conduit circuits. 3,749,122, Cl. 137-515.700.

Gold, Nicholas, to Polaroid Corporation. Photographic film container. 3,748,983, Cl. 95-19.000.

Gold, Nicholas, to Polaroid Corporation. Photographic film assemblage and apparatus. 3,748,984, Cl. 95-19.000.

Goldschmidt, David H.: *See—*
Lofredo, Anthony; and Goldschmidt, David H., 3,748,864.

Goldstein, Albert: *See—*
Adler, Ralph W.; Goldstein, Albert; and Haase, Robert, 3,749,027.

Golner, Jerold Julius: *See—*
Feinstein, Sumner Sheldon; Golner, Jerold Julius; D'Amato, Salvatore; and Trunk, Eugene John, 3,748,939.

Golosov, Viktor Fedorovich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

Golton, William C.; and Rutkiewic, Andrew F., to Du Pont de Nemours, E. I., and Company. Stabilized solutions of N-halo compounds. 3,749,672, Cl. 252-95.000.

Gomi, Kiyondo: *See—*
Irie, Yoshihiko; Kato, Mahiko; and Gomi, Kiyondo, 3,748,903.

Good, Harper Willard: *See—*
Carpenter, James Hugh; and Good, Harper Willard, 3,748,787.

Goode, George E.: *See—*
Lockerd, Robert M.; Smith, Mark W.; Cooper, Ray E.; and Goode, George E., 3,750,175.

Goodnight, Hershel E.: *See—*
Reed, Robert D.; Zink, John Smith; and Goodnight, Hershel E., 3,749,546.
Zink, John S.; Reed, Robert D.; and Goodnight, Hershel E., 3,749,548.

Goodrich, B. F., Company, The: *See—*
Orndorff, Roy L., Jr., 3,748,951.

Gordon Engineering Company: *See—*
Lucas, Paul G., 3,750,146.

Gordon, Jerry Dale. Aircraft towing vehicle. 3,749,266, Cl. 214-334.000.

Gorl, Richard: *See—*
Balse, Helmut; and Gorl, Richard, 3,749,193.

Goto, Mitsuhiro, to Kabushiki Kaisha Suwa Seikosha. Thin-type switchboard. 3,750,062, Cl. 335-206.000.

Graff, Ronald A. Illuminated wax form and method of making same. 3,749,904, Cl. 240-10.00b.

Graham, David Alan: *See—*
Stearns, Burdett Kinney; Graham, David Alan; Seemann, James Marion; and Zink, George, 3,748,958.

Graham, Donald W.: *See—*
Hannah, John; Graham, Donald W.; and Rogers, Edward F., 3,749,734.

Graham, Joseph P.: *See—*
Daniels, Stacy L.; and Graham, Joseph P., 3,749,110.

Granlund, Gosta Holger, to Saab-Scania Aktiebolag. System for automatically checking brake regulating systems. 3,750,101, Cl. 340-52.00b.

Gransart, Philippe: *See—*
Diepart, Paul; Gransart, Philippe; and Maitrias, Gerard, 3,749,940.

Grant, Clarence L.: *See—*
Scammon, Lawrence W., Jr.; Grant, Clarence L.; and Wilks, Philip H., 3,749,763.

Grant Oil Tool Company: *See—*
Leathers, Clarence H., 3,749,187.

Grattoni, Giusio. Hand manipulative ball and race puzzle device. 3,749,405, Cl. 273-153.00r.

Gravitt, Elmer W. Fish lure. 3,748,772, Cl. 43-41.000.

Gray, Paul E., to Veeder Industries, Inc. Optical display device and drive circuit therefor. 3,750,140, Cl. 340-336.000.

Gray, Vernon H., to United States o America, National Aeronautics and Space Administration. Space vehicle with artificial gravity and earth-like environment. 3,749,332, Cl. 244-1.0sc.

Green, Lawrence E., to General Motors Corporation. Variable power train and control. 3,748,929, Cl. 74-844.000.

Greene, Nat, to KDI American Products, Inc. Water conduit connector. 3,749,424, Cl. 285-161.000.

Greenwood, Donald, to G-L-J Toy Co., Inc. Motion picture film projector. 3,749,482, Cl. 352-80.000.

Gregg, Michael C.; and Cox, Charles S., to United States of America, Navy. Conductivity and temperature sensing probe. 3,748,899, Cl. 73-170.00a.

Gregg, Roland S., to Bunker-Ramo Corporation, The. Method and apparatus for code conversion. 3,750,147, Cl. 340-347.0dd.

Gregory, Eric; Marancik, William G.; and Shattes, Walter J., to Airco, Inc. Flashlamp with improved combustible foil. 3,749,547, Cl. 431-95.000.

Grenier, Wilfred J., to General Industries, Inc. Automatic on-off sprinkler head. 3,749,176, Cl. 169-37.000.

Grider, Lyle D., to Buryrus-Erie Company. Boom extension lock. 3,749,254, Cl. 212-55.000.

Grier, John D.; and Camp, Harold E., to Owens-Illinois, Inc. Visual data handling systems. 3,749,487, Cl. 355-1.000.

Griffin, Kenneth Earl, 50% to Kramis, Lawrence E. Tunnel cleaning apparatus. 3,748,680, Cl. 15-50.00c.

Grigoriev, Vladimir Konntantinovich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

Griscom, Richard W.: *See—*
Brader, James J., Jr.; and Griscom, Richard W., 3,749,801.

Griswold, Augustus W.: *See—*
Batchelder, John M.; and Griswold, Augustus W., 3,749,631.

Groetschel, Karl Maria. Mine roof support with means for lifting the base elements. 3,748,861, Cl. 61-45.00d.

Grohe, Hans KG, Firma: *See—*
Luder, Ernst; and Buzzi, Gunther, 3,749,345.

Groswith, Charles T., III: *See—*
Abildgaard, William H.; and Groswith, Charles T., III, 3,749,422.
Abildgaard, William H.; and Groswith, Charles T., III, 3,749,423.

Grow, Bruce W.: *See—*
Grow, Harlow B., 3,749,097.

Grow, Craig H.: *See—*
Grow, Harlow B., 3,749,097.

Grow, Harlow B., 1/3 each to Grow, Craig H. and Grow, Bruce W. Internal combustion engine control. 3,749,097, Cl. 123-106.00r.

Grundell, Carl Erik. Method for obtaining a connection between a sheet member and a suspension member. 3,748,971, Cl. 93-1.00e.

Grunert, Hellmuth. Adjustable hinge for butt-closing doors. 3,748,689, Cl. 16-129.000.

Grunner, George P.: *See—*
Mutter, William W.; and Grunner, George P., 3,748,845.

GTE Automatic Electric Laboratories Incorporated: *See—*
Ammann, Robert W., 3,749,945.
Blackman, Kent G.; and Hrdlicka, Eugene R., 3,750,091.
Dufton, John Peter, 3,749,844.
Kobylar, Alex W.; Lindsay, Robert L.; and Pitroda, Satyan G., 3,750,111.
Lender, Adam, 3,750,021.
Macrander, Max S., 3,749,856.
Schmidt, Charles E., 3,750,037.
Teman, Zale E., 3,750,090.
Valassis, John G., 3,750,114.
Young, John S., 3,749,846.

GTE Sylvania Incorporated: *See—*
Asplund, Robert W., 3,749,073.

Gudmand-Hoyer, Mita Maria, to Dan-Fire-Energy ved Mita Gudmand-Hoyer. Heat energy system and apparatus for production of hot water, steam or heat-gas. 3,749,079, Cl. 126-116.00r.

Guild, Lloyd V., to Scientific Kit Corporation. Gas flow meter. 3,748,902, Cl. 73-194.00r.

Gulf & Western Industrial Products Company: *See—*
Burgess, Lester E., 3,749,021.

Gulf Oil Corporation: *See—*
Wolfelsperger, Robert O.; and Pinto, Patrick J., 3,749,393.

Gulf Research & Development Company: *See—*
Hoffmann, Otto L., 3,749,566.

Gulistan, Bulent, to Deutsch Fastener Corporation. Captive screw for thin panels. 3,749,144, Cl. 151-69.000.

Gumbelevicius, John: *See—*
Fannin, Eugene R.; and Gumbelevicius, John, 3,749,618.

Gumbleton, James J.; and Kuehl, Paul B., to General Motors Corporation. Exhaust gas recirculation control valve. 3,749,071, Cl. 123-119.00a.

Gunnill, Edward F.: *See—*
Lorenzi, Silvio J.; Dodds, Robert M.; and Gunnill, Edward F., 3,748,794.

Gusstahlwerk Wittmann AG: *See—*
Venus, Willisbald, 3,748,858.

Gutman, Arnold D., to Stauffer Chemical Company. Oxime carbamate phosphate phosphonate, phosphinate and phosphorcamidates. 3,749,748, Cl. 260-455.00p.

Guttler, Hermann: *See—*
Roethke, Ernst; and Guttler, Hermann, 3,749,327.

Guttmann, Stephan; Sandrin, Edmond; Pless, Janos; and Willems, Hans, to Sandoz Ltd; a/k/a Sandoz AG. ASN^{15}-bovine thyrocalcitonion. 3,749,703, Cl. 260-112.500.

Guzak, John, Jr., to SCM Corporation. Electronic tabulation control system for recorder. 3,749,223, Cl. 197-176.000.

H&H Manufacturing Company: *See—*
Hitchcock, Delbert, 3,749,436.

Haase, Robert: *See—*
Adler, Ralph W.; Goldstein, Albert; and Haase, Robert, 3,749,027.

Hadam, Wilhelm; and Muller, Adam, to Stoll, H., and Company. Needle bed racking mechanism in a flat knitting machine. 3,748,872, Cl. 66-69.000.

Haeberle, Fritz: *See—*
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, 3,749,209.

Haemonetics Corporation: *See—*
Latham, Allen, Jr., 3,749,285.

HAG Aktiengesellschaft: *See—*
Lehmann, Gunter; Neunhoeffer, Otto; Roselius, Wilhelm; and Vitzthum, Otto, 3,749,698.

Hagenbeuk, Henk: *See—*
Kuijk, Karel Elbert; and Hagenbeuk, Henk, 3,749,939.

Hager, Howard K.: *See—*
Vaskunas, Vygantas A.; and Hager, Howard K., 3,749,889.

Hagood, Jerry W.; and Shelton, Joe, to United States of America, Atomic Energy Commission. Solid state radiation detector. 3,749,915, Cl. 250-336.000.

Haley, Ernest K. Adjustable horizontal hole drilling apparatus. 3,749,507, Cl. 408-46.000.

Hall, John A., Sr., to Weatherford Oil Tool Company, Inc. Well centralizer. 3,749,168, Cl. 166-241.000.

Hall, William Bernard: *See—*
Voigt, Edward Harold; and Hall, William Bernard, 3,749,383.

Hallin, Robert W., to Honeywell Inc. Magnet actuating arrangement for a magneto sensitive device and method for providing. 3,750,068, Cl. 335-306.000.

Halpern, Samuel E.; Tubis, Manuel; and Endow, John S., to United States of America, Veterans Administration. Renal scanning composition and method using technetium 99m. 3,749,913, Cl. 250-303.000.

Hamilton, Douglas D., 1/3 to Canadian International Paper Company, 1/3 to Quebec North Shore Paper Company and 1/3 to Abitibi St. Anne Paper Ltd. Method and apparatus for felling trees. 3,749,143, Cl. 144-309.0ac.

Hammann, Ingeborg: *See—*
Fest, Christa; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,749,720.

Hammond Corporation: *See—*
Schrecongost, Ray B., 3,748,944.

Hampin, Karl Rune: *See—*
Borup, Alf Lennart; and Hampin, Karl Rune, 3,749,310.

Hamri, Bernard Andre Bel. Apparatus to obtain fresh water from moisture containing air. 3,748,867, Cl. 62-271.000.

Hancock, Earl A.; and MacPherson, James R. Rocket-powered signaling device. 3,749,019, Cl. 102-34-400.

Hanlon & Wilson Company: *See—*
Von Hoevel, Edmund H.; and Bolte, Robert A., 3,748,850.

Hannah, John; Graham, Donald W.; and Rogers, Edward F., to Merck & Co., Inc. 1-Cyanobenzimidazoles. 3,749,734, Cl. 260-309.200.

Hans, Jager, to Jager, Emil, KG. Drive for producing movement of the lay in weaving looms. 3,749,137, Cl. 139-190.000.

Hansen, Warren T., to Bear Manufacturing Corporation. Power mechanism and safety lock therefor. 3,748,969, Cl. 92-19.000.

Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Method of making an article having a hard and ornamental coating. 3,749,656, Cl. 204-181.000.

Hardebeck, Klaus: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,749,724.

Hargraves, William J. Overflow arrangement. 3,749,246, Cl. 210-199.000.

Harper, George S.; and Shand, John Richard, to Airpax Electronics Incorporated. Circuit breaker housing. 3,749,873, Cl. 200-168.00r.

Harrison, Thomas S., to Sterling Drug Inc. Exit slit for bulk package moist towels or tissues. 3,749,296, Cl. 225-106.000.

Hart, Claude A.; and Haycock, Eric W., to Dunlop Holdings Limited. Pneumatic tires. 3,749,145, Cl. 152-209.00r.

Hartgrove, Earl H., Jr., to Stevens, J. P., & Co., Inc. Textile finishing compositions. 3,749,597, Cl. 117-138.80f.

Hartman, Arlie. Garden cultivator. 3,749,179, Cl. 172-297.000.

Hartmann, Clinton S., to Texas Instruments, Incorporated. Surface wave frequency discriminators. 3,750,027, Cl. 325-349.000.

Harvey, Ralph R.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.

Harvey, Robert L.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.

Harz, Hermann, to Siemens Aktiengesellschaft. Brushless rotary converter for continuous speed control and single phase alternating current. 3,749,990, Cl. 318-166.000.

Hashimoto, Kozo: *See—*
Tamura, Toru; Kondo, Shigeru; and Hashimoto, Kozo, 3,750,054.

Hastwell, Peter J., to Savin Business Machines Corporation. Cleaning system for wetting tank rollers. 3,749,050, Cl. 118-4.000.

Hasui, Atsushi, to Director of National Research Institute for Metals, The. Apparatus for friction welding. 3,749,298, Cl. 228-2.000.

Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., to Dow Chemical Company, The. Poly (hydroxyarylpolymethylenesulfonium) zwitterionic monomers and surface coatings therefrom. 3,749,737, Cl. 260-332.30r.

Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., to Dow Chemical Company, The. Poly(hydroxyarylpolymethylenesulfonium) zwitterionic monomers and surface coatings therefrom. 3,749,738, Cl. 260-332.30r.

Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., to Dow Chemical Company, The. Poly(hydroxyarylpolymethylenesulfonium) zwitterionic monomers and surface coatings therefrom. 3,749,739, Cl. 260-332.20a.

Hatcher, Lloyd T.: *See—*
Boatwright, Daniel J.; and Hatcher, Lloyd T., 3,749,815.

Hauber, Ferdinand R., to Brown & Root, Inc. Universal offshore pipeline riser clamp assembly. 3,749,429, Cl. 287-54.00a.

Haugwitz, Rudiger D.; Maurer, Barbara V.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Thiazolinyl and thiazinyl derivatives of benzimidazoles. 3,749,717, Cl. 260-243.00r.

Hauni-Werke Korber & Co., KG: *See—*
Elsner, Uwe; and Komossa, Werner, 3,748,786.
Krause, Lothar, 3,749,634.

Hause, Gilbert K., to General Motors Corporation. Hydrostatic transmission power package. 3,748,851, Cl. 60-19.000.

Hauser, Jean. Jacks for use with containerized cargoes. 3,749,363, Cl. 254-45.000.

Havlik, John J.; and Towell, Billy H., to Texaco Inc. Compressed gas seismic energy generator. 3,750,097, Cl. 340-12.00r.

Hay, David Gilbert: *See—*
Williams, Darrell Andrew; Wisinski, Adam Prus; and Hay, David Gilbert, 3,749,297.

Hayami, Heijiro; Kan, Ryuzo; and Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Image signal converter in facsimile. 3,749,836, Cl. 178-69.5t.

Haycock, Eric W.: *See—*
Hart, Claude A.; and Haycock, Eric W., 3,749,145.

Hayko, Richard. Tic-tac-toe apparatus with pockets having rebounting surfaces. 3,749,401, Cl. 273-95.00a.

Hazeltine Corporation: *See—*
Marcucci, Ronald R.; and Galatioto, Santo C., 3,750,034.

Heard, Roderick S.: *See—*
Fowler, Raymond L.; and Heard, Roderick S., 3,748,976.

Heaton, A. H., to Aqua Systems and Products of Michigan, Inc., mesne. Well service structure. 3,749,165, Cl. 166-88.000.

Hebert, Hugh P.: *See—*
Lockwood, William H., Jr.; and Hebert, Hugh P., 3,749,666.

Hecker, Klaus J., to United States of America, Navy. IFF-System. 3,750,163, Cl. 343-6.50r.

Heckler & Koch GmbH: *See—*
Moller, Tilo; and Ketterer, Dieter, 3,748,959.

Hegar, Gert, to Ciba-Geigy AG. Water-soluble, basic heterocyclic azo aminoethyl dyestuffs containing a quaternary ammonium alkanoyl substituent. 3,749,708, Cl. 260-156.000.

Hegeman, George D.; and Ellman, George L., to University of California, The Regents of the. Measurement of urinary D-vanillylmandelic acid. 3,749,643, Cl. 195-103.50r.

Heider, James Elmer; and Schult, Thomas H., to Owens-Illinois, Inc. Method and apparatus for chilling mold elements. 3,748,868, Cl. 62-99.000.

Heinz, H. J., Company: *See—*
Steinle, John T.; and Brooks, Carl H., 3,749,264.

Heiser, Joachim, to Bosch, Robert, G.m.b.H. Hydraulic motor control arrangement. 3,748,857, Cl. 60-388.000.

Heitner, Alfred: *See—*
Esser, Klaus; Schurmann, Helmut; Heitner, Alfred; and Hildebrandt, Norbert, 3,749,908.

Helbig, Walter Allen, Sr.; and Ross, Walter Lee, to RCA Corporation. Home television receiver modified to operate as video terminal. 3,750,133, Cl. 340-324.0ad.

Helfer, Friedrich: *See—*
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, 3,749,209.

Helfet, Arthur Jacob. Replacements for bicondylar joints in human limbs. 3,748,662, Cl. 3-1.000.

Heller, William C., Jr., mesne: *See—*
Leatherman, Alfred F., 3,749,015.

Hellouin de Menibus, Olivier Andre Henry Louis, to Societe d'Appareillages et Materiels de Servitudes, "A.M.S." Societe Anonyme. Method and apparatus related to the testing of hydraulic circuits. 3,748,898, Cl. 73-168.000.

Helmbold, James E.: *See—*
Bruckner, Ronald L.; and Helmbold, James E., 3,750,000.

Hem, Svein: *See—*
Burrows, Philip Richard Miles; Hem, Svein; and Terry, Michael Peter Alwyn, 3,749,891.

Hemscheidt, Hermann, Maschinenfabrik: *See—*
Welzel, Josef, 3,748,862.

Henderson, Barry C. Continuous heating apparatus for granular material. 3,749,549, Cl. 432-49.000.

Henningsen Foods, Inc.: *See—*
Cook, Charles H.; and Bergquist, Dwight H., 3,748,919.

Henrick, Clive A.: *See—*
Siddall, John B.; and Henrick, Clive A., 3,749,744.

Hepburn, John James: *See—*
Cox, Colin John; and Hepburn, John James, 3,749,583.

Hepworth, Walter; and Stacey, Gilbert Joseph, to Imperial Chemical Industries, Limited. Pharmaceutical compositions. 3,749,787, Cl. 424-270.000.

Hercules Incorporated: *See—*
Regelson, William, 3,749,771.

Herlich, Gilbert A.: *See—*
Gehman, John B.; Herlich, Gilbert A.; and Mikuteit, Seigfried, 3,750,167.

Hermann, Heinz; and Ocker, Herbert, to Werner & Pfleiderer. Process for mixing, kneading and granulating thermosetting plastic material in continuous operation. 3,749,375, Cl. 259-192.000.

Hermanutz, Peter, to International Standard Electric Corporation. Adjustable frequency-dependent equalizer. 3,750,052, Cl. 333-28.00r.

Hermes, Heinz: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.

Herpich, William A.; Park, Glenn S.; and Palmer, George W., to Peabody Galion Corporation. Refuse collection vehicle. 3,749,261, Cl. 214-82.000.

Herrmann, Wolfgang; and Satzinger, Gerhard, to Warner-Lambert Pharmaceutical Company. Process for the production of pure hexetidine. 3,749,721, Cl. 260-256.40h.

Hershkowitz, Joseph, to United States of America, Air Force. Flexible hollow spheres. 3,749,016, Cl. 102-1.00r.

Hertrich, Friedrich R., to Iomec, Inc. Opto-electronic transducer for position initialization of a linear motion mechanism. 3,749,925, Cl. 250-237.00g.

Hertzog, Heber T.; and Kamstra, Peter, to Garrett Corporation, The. Multi-engine to single shaft torque transmission. 3,748,927, Cl. 74-675.000.

Hess, Grace A.: *See—*
Hess, Marlin F.; and Hess, Grace A., 3,749,147.

Hess, Marlin F.; and Hess, Grace A. Vehicle screen. 3,749,147, Cl. 160-354.000.

Hessert, James E.; and Clampitt, Richard L., to Phillips Petroleum Company. Methods of in the treatment of wells using gelled polymers. 3,749,172, Cl. 166-274.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 4-(2-Benzoylphenyl)-2,4-dihydro-5 L(alkylamino)alkyl]-3H-1,2,4-triazol-3-ones and process. 3,749,733, Cl. 260-308.00c.

Hewitt, Redginal Irving, to American Cyanamid Company. Method of treating malaria with 3-(p-chlorophenyl)-6-lower alkylamino or dilower alkylamino-s-tetrazines. 3,749,780, Cl. 424-244.000.

Hewlett-Packard Company: *See—*
Frankenberg, Robert J., 3,750,119.
Kohoutek, Jindrich; and Near, Charles W., 3,749,899.
Raynham, Michael B., 3,750,105.

Heyman Manufacturing Company: *See—*
Jemison, William, 3,749,818.

Hibbeler, Charles L., to Nooter Corporation. Tubesheet construction. 3,749,161, Cl. 165-178.000.

Hickman, Albert F. Tandem wheel vehicle spring suspension. 3,749,417, Cl. 280-104.50r.

Hider, Shibley A.; Kitaj, Walter; and Martin, Robert E., to Owens-Illinois, Inc. Method for forming a polysiloxane impregnated porous sheet and article thereof. 3,749,591, Cl. 117-21.000.

Hietanen, Edwin D.; and Valek, Robert J., to Bendix Corporation, The. Automatic quality control surface inspection system for determining the character of a surface by measuring the same and intensity of a modulated beam. 3,749,496, Cl. 356-73.000.

Higgins, John: *See—*
Priestley, Harry; and Higgins, John, 3,749,036.

Hiklert, Thomas L.; Fransson, Goran E.; and Trenbeath, Richard E., to Barber-Colman Company. Hob shifter. 3,748,962, Cl. 90-4.000.
Hildebrand, George L., to General Electric Company. Gyroscope with universally mounted rotor. 3,748,912, Cl. 74-5.000.
Hildebrandt, Norbert: *See—*
Esser, Klaus; Schurmann, Helmut; Heitner, Alfred; and Hildebrandt, Norbert, 3,749,908.
Hildebrandt, Robert A.: *See—*
Marchese, Louie J.; and Hildebrandt, Robert A., 3,748,697.
Hileman, Dale. Vehicle navigation system. 3,749,893, Cl. 235-150.270.
Hill, Donald G.; Smith, Charles F.; and Kucere, Clare H., to Dow Chemical Company, The. Displacement of drilling fluids from boreholes. 3,749,173, Cl. 166-291.000.
Hill, Robert M., to Stanford Research Institute. Electrodynamic molecular beam device. 3,749,909, Cl. 250-251.000.
Hill, William J.; Starvaski, Raymond R.; and Woodrow, Harold E., to Morgan Construction Company. Magnetic inverter. 3,749,256, Cl. 214-1.00q.
Hiller, Montague. Chemical closets. 3,748,663, Cl. 4-115.000.
Hinderks, Larry Wardell: *See—*
Fellers, Rufus Gustavus; and Hinderks, Larry Wardell, 3,750,012.
Hines, Burgess W., to Emerson Electric Co. Control boxes. 3,750,076, Cl. 337-348.000.
Hinkley, David F., to Merck & Co., Inc. Novel derivatives of isoascorbic acid and methods of producing and using same. 3,749,680, Cl. 252-400.00a.
Hintsa, Roy A.: *See—*
Tough, William J.; and Hintsa, Roy A., 3,748,799.
Hirata, Yoshihiro, to Nihon Denshi Kabushiki Kaisha. Electron beam device. 3,749,964, Cl. 315-18.000.
Hirsch, Alfred E., Jr.: *See—*
Sessler, Gerhard Martin; West, James Edward; and Hirsch, Alfred E., Jr., 3,750,149.
Hirsch, Joseph G.: *See—*
Ayers, Weston D.; and Hirsch, Joseph G., 3,750,127.
Hirvela, Robert J., to Collins Radio Company. System failure monitor title. 3,749,897, Cl. 235-153.0ak.
Hitachi, Ltd.: *See—*
Matuzaki, Tetuo; Nakamura, Toshio; and Egawa, Hitoshi, 3,749,459.
Hitchcock, Delbert, to H&H Manufacturing Company. Tractor bumper construction. 3,749,436, Cl. 293-73.000.
Hitcs: *See—*
Rheaume, Walter A.; and Campman, Arthur R., 3,749,138.
Hobner, Siegfried, to Walther, Carl, Sportwaffenfabrik. Silencer for fire arms. 3,748,956, Cl. 89-14.00d.
Hodgdon, Russell B., Jr., to Ionics, Incorporated. Ion exchange membranes having a macroporous surface area. 3,749,655, Cl. 204-180.00p.
Hodges, Marvin P., to Ranging, Inc. Gun sighting and ranging mechanism. 3,749,494, Cl. 356-16.000.
Hoelscher, William R., to United States Elevator Corporation. Elevator floor leveling system. 3,749,203, Cl. 187-29.00r.
Hoerner Waldorf Corporation: *See—*
Ingle, Robert B., 3,749,299.
Hoesch, Vernon S. Deal plate. 3,748,766, Cl. 40-63.00r.
Hoffman Rheem Maschinen GmbH: *See—*
Engelbart, Wilhelm, 3,749,292.
Hoffman-La Roche Inc.: *See—*
Cort, Winifred; and Newmark, Harold Leon, 3,749,799.
Hoffmann, Otto L., to Gulf Research & Development Company. Improving resistance of rice seed to pre-emergence herbicides. 3,749,566, Cl. 71-100.000.
Hoffmann-La Roche Inc.: *See—*
Rousselet, Andre; and Durand, Pierre, 3,748,911.
Hofmann, Dionys, to Hofmann, Dionys, GmbH. Method and apparatus for automatic balancing of motor vehicle wheels. 3,748,910, Cl. 73-468.000.
Hofmann, Dionys, GmbH: *See—*
Hofmann, Dionys, 3,748,910.
Hogan, Martin J., to General Motors Corporation. Two-piece pressed metal bearing race with means for resilient mounting. 3,749,460, Cl. 308-196.000.
Holdway, John B.; and Tyburski, Robert M., to Optical Recognition Systems, Inc. Document transport and stacking device and system. 3,749,239, Cl. 209-74.00r.
Hollister, Kenneth R.; and Perry, Ernest J., to Eastman Kodak Company. Photographic emulsions containing polymeric peptizer with quaternary ammonium groups. 3,749,577, Cl. 96-114.000.
Holmwood, Owen L.: *See—*
Carey, Peter M.; and Holmwood, Owen L., 3,750,135.
Holohan, Bartholomew A., to Tica Industries, Limited. Safety razor. 3,748,734, Cl. 30-60.500.
Holub, Fred F., to General Electric Company. Method for preparing amides of trimellitic anhydride and product therefrom. 3,749,722, Cl. 260-268.00c.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao; and Akima, Akira, 3,749,112.
Okada, Motohiro, 3,750,102.
Honeywell Inc.: *See—*
Amdur, Elias J., 3,749,129.
Hallin, Robert W., 3,750,068.
Kompelien, Arlon D., 3,749,934.
Lindquist, Oiva Herbert, 3,748,900.
Mott, Richard C.; and Wentworth, Milo R., 3,749,306.
Honeywell Information Systems, Inc.: *See—*
Lee, Dae-Woo, 3,750,121.
Honjo, Satoru: *See—*
Sato, Masamichi; Matsumoto, Seiji; Fukushima, Osamu; and Honjo, Satoru, 3,749,927.
Honmi, Tadashi: *See—*
Nakane, Kazushige; Honmi, Tadashi; and Koike, Katsumi, 3,748,873.
Hooker Chemical Corporation: *See—*
Leon, Edward; and Shatz, Malcolm H., 3,749,611.
Pawlak, Joseph A.; and Bean, Claude Thomas, Jr., 3,749,686.
Hooper, David W.; and Putnam, Pual S. Hydraulically operated fluid aggregate pump. 3,749,525, Cl. 417-343.000.
Hoover, James Eugene; Houser, Robert Wilson; and Sheffer, Bernard Clifford, to GAF Corporation. Automatic assembly machine for film cartridges. 3,748,715, Cl. 29-211.00d.
Hoover, Richard B.; and Underwood, James H., to United States of America, National Aeronautics and Space Administration. Collimator of multiple plates with axially aligned identical random arrays of apertures. 3,749,911, Cl. 250-482.000.
Hopkins, William J.: *See—*
Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., 3,749,669.
Hopt Electronic GmbH: *See—*
Mayer, Rudolf; Sakautzki, Hans; and Volkheimer, Lothar, 3,750,031.
Hori, Hiroo: *See—*
Miyashiro, Shoichi; Ogawa, Kazuyuki; and Hori, Hiroo, 3,749,969.
Houldcroft, Peter Thomas: *See—*
Sullivan, Arthur Basil Joseph; and Houldcroft, Peter Thomas, 3,749,878.
Houser, Robert Wilson: *See—*
Hoover, James Eugene; Houser, Robert Wilson; and Sheffer, Bernard Clifford, 3,748,715.
Howitt, John S.; and Pitbladdo, Richard B., to Corning Glass Works. Flow deflector for exhaust gases. 3,749,130, Cl. 138-42.000.
Howland, William R. Take-off duct coupler. 3,749,425, Cl. 285-191.000.
Hoyt, Earl: *See—*
Mele, Sidney C.; and Hoyt, Earl, 2,749,274.
Hrdlicka, Eugene R.: *See—*
Blackman, Kent G.; and Hrdlicka, Eugene R., 3,750,091.
Hruby, John O., Jr., to Rain Jet Corp. Ornamental fountain with multitier or horizontal discharge patterns. 3,749,311, Cl. 239-17.000.
Hudson Products Corporation: *See—*
Johnson, Glenn H., 3,748,918.
Hughes Aircraft Company: *See—*
Curry, Samuel J.; and Reisenfeld, Sam, 3,750,022.
Gallagner, Hayden E., 3,749,978.
Reed, Noel E., 3,750,061.
Tittle, Harry D., 3,749,601.
Hull, Gerry G.; and Morris, Eugene B., Jr. Coin processing apparatus. 3,748,821, Cl. 53-159.000.
Humphreys Corporation: *See—*
Scammon, Lawrence W., Jr.; Grant, Clarence L.; and Wilks, Phillip H., 3,749,763.
Hunhoff, Raymond: *See—*
Primus, Norman S.; and Hunhoff, Raymond, 3,749,056.
Hunnicutt, Wayne E.: *See—*
Macomber, Franklin S.; and Hunnicutt, Wayne E., 3,749,268.
Hunt, Mack W.: *See—*
Sparlin, Derry D.; and Hunt, Mack W., 3,749,589.
Hunter, John Earl, to Procter & Gamble Company, The. Protein supplemented clear fruit jellies. 3,749,588, Cl. 99-132.000.
Huntington, Fred A., to RCBS, Inc. Primer orientation tray. 3,748,950, Cl. 86-24.000.
Huron Tool and Mfg. Co.: *See—*
Oldford, William G., 3,749,250.
Husome, Robert G., to Acurex Corporation. Optical label inspecting apparatus. 3,749,923, Cl. 250-223.000.
Hustead, Ralph L. Universal pitch, hinged clamp roof support. 3,749,428, Cl. 287-20.950.
Hutchens & Sons Metal Products, Inc.: *See—*
Traylor, Charles O., 3,749,196.
Hyde, William P. Garbage classi2ication system. 3,749,324, Cl. 241-58.000.
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kaiaoka, Toshimitsu, to Nippon Telegraph and Telephone Public Corporation and Anritsu Electric Company, Ltd. Coin discriminating apparatus. 3,749,220, Cl. 194-100.00a.
ICI Australia Limited: *See—*
Williams, Darrell Andrew; Wisinski, Adam Prus; and Hay, David Gilbert, 3,749,297.
Ignatjev, Vladimir: *See—*
Beeken, Basil B.; and Ignatjev, Vladimir, 3,749,127.
Ikeda, Tadashi: *See—*
Sato, Akira; Ikeda, Tadashi; Nakazawa, Yoshiyuki; and Takei, Haruo, 3,749,714.
Ikegai Tekko Kabushiki Kaisha: *See—*
Sato, Yoshimasa; and Togashi, Syozo, 3,749,622.
ILG Industries, Inc.: *See—*
Napadow, Stanley C., 3,749,229.

Illinois Tool Works Inc.: *See—*
Erickson, Lloyd A., 3,748,881.
Iltis, Rumult: *See—*
Wooten, George W.; Iltis, Rumult; and Johnson, Victor L., 3,749,929.
Imataki, Mitsumasa, to Mitsubishi Denk Kabushiki Kaisha. Liquid-prevention device for arc-extinguishing gas compressed-gas circuit breakers. 3,749,869, Cl. 200-148.00b.
Imex A.G.: *See—*
Versteeg, Gijsbert, 3,748,720.
Imperial Chemical Industries, Limited: *See—*
Clark, James; McMenim, Michael Edward; and Rose, Francis Leslie, 3,749,719.
Hepworth, Walter; and Stacey, Gilbert Joseph, 3,749,787.
Sachs, George; Dunn, Anthony Kenneth; and Skuce, William Frederick, 3,748,745.
Inaga, Hisashi: *See—*
Kobayashi, Torao; and Inaga, Hisashi, 3,749,067.
Inagaki, Yutaka: *See—*
Shiga, Tetsuya; Inagaki, Yutaka; and Matsubara, Hironaga, 3,749,817.
Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio, 3,749,526.
Industriewerk Schaeffler, OGH: *See—*
Staneff, Stefan, 3,748,694.
Ing. C. Olivetti & C. S.p.A.: *See—*
Bazzarone, Fedele; and Bisone, Dario, 3,749,395.
Ingersoll-Rand Company: *See—*
Shipman, Clarence S., 3,749,190.
Ingle, Robert B., to Hoerner Waldorf Corporation. Compartmented containers. 3,749,299, Cl. 229-15.000.
Innocenti Societa; Generale per l'Industrie Metallurgica e Meccanica: *See—*
Galbarini, Masu; and Cotta Ramusino, Francesco, 3,748,965.
Innova Incorporated: *See—*
Adickes, Cecil F.; Beaubien, Thomas S.; Weir, George R.; and Echterling, Eugene J., 3,749,402.
Institut Francais Du Petrole Des Carburants Et Lubrifiants: *See—*
Joubert, Philippe; and Castel, Yvon, 3,749,367.
Institutal de Proiectari al Industriei Usoare Ipiu: *See—*
Constantinescu, Petre; Popescu, Mihail; and Dumitrescu, Constantin, 3,748,801.
Institute of Gas Technology: *See—*
Long, George M., 3,749,108.
Intercontinental Services, Inc.: *See—*
Kagele, Frank L.; Meyers, Lavern H.; and Trent, Edward J., 3,749,007.
Interface Industries, Inc.: *See—*
Vaskunas, Vygantas A.; and Hager, Howard K., 3,749,889.
International Business Machine Corporation: *See—*
Laman, William H., 3,749,993.
International Business Machines Corporation: *See—*
Almasi, George S., 3,750,154.
Anantha, Narasipur Gundappa, 3,749,987.
Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., 3,749,008.
Clecak, Nicholas J.; and Cox, Robert J., 3,749,713.
Fleischer, John M., 3,750,189.
Fowler, Raymond L.; and Heard, Roderick S., 3,748,976.
Kemerer, Douglas Wayne, 3,750,116.
Kolpek, Robert A.; and Stewart, William R., Jr., 3,749,849.
Leone, Louis William; Morange, Theodore Adam; Reilly, Donald Francis; and Schram, Paul James, 3,750,018.
Naylor, Hugh E., III, 3,750,191.
International Nickel Company, Inc.: *See—*
Benjamin, John Stanwood; Cairns, Robert Lacock; and Weber, John Herbert, 3,749,612.
International Paper Company, mesne: *See—*
Lee, Charles A.; and Furbeck, Warren R., 3,749,624.
International Radio & Electronics Corporation: *See—*
Stanely, Gerald R., 3,750,044.
International Scanning Devices, Inc.: *See—*
Sliker, Lawrence S., 3,749,977.
International Standard Electric Corporation: *See—*
Bolus, Daniel; Lerouge, Claude Paul Henri; and Regnier, Marc Andre, 3,750,144.
Cramer, Bernhard; and Schilling, Helmut W., 3,750,150.
Hermanutz, Peter, 3,750,052.
International Telephone and Telegraph Corporation: *See—*
Cooper, James Joseph, Jr., 3,750,075.
Dunn, James G.; and Cowan, John R., 3,750,024.
Kuecken, John A., 3,750,184.
Mulst, George D., 3,750,178.
Sapir, Said, 3,750,128.
Swann, Richard C. G.; and Penton, Jack I., 3,749,610.
Intertechnique S.A.: *See—*
Thomas, Edward W.; and Rapkin, Edward, 3,749,916.
Inventio Aktiengesellschaft: *See—*
Engeler, Karl, 3,749,224.
Iomec, Inc.: *See—*
Hertrich, Friedrich R., 3,749,925.
Ion Equipment Corporation: *See—*
Slabaugh, Edward J., 3,749,058.
Ionics, Incorporated: *See—*
Hodgdon, Russell B., Jr., 3,749,655.
Irie, Yoshihiko; Kato, Mahiko; and Gomi, Kiyondo, to Tokico, Ltd. Flow meter having vertical rotor shafts. 3,748,903, Cl. 73-261.000.
Ishizaki, Masayuki: *See—*
Mohri, Yohichi; and Ishizaki, Masayuki, 3,748,926.
Isono, Masao: *See—*
Takahashi, Takeshi; Kawahara, Kenji; and Isono, Masao, 3,749,641.
Takahashi, Takeshi; Takahashi, Toshiyuki; and Isono, Masao, 3,749,642.
Israel, Sanford L., to United Nuclear Corporation. Nuclear reactor having improved coolant reflecting arrangement. 3,749,640, Cl. 176-78.000.
Iversen, Ralph T., to General Telephone Company of California. Rapid connector. 3,750,086, Cl. 339-75.00m.
Iwawaki, Yasutaka: *See—*
Moriya, Shozo; Ohta, Shoji; Iwawaki, Yasutaka; and Usui, Yukio, 3,749,852.
J & H Co.: *See—*
Burn, Joseph, 3,748,812.
J & J Manufacturing Company: *See—*
Cox, Thomas L., 3,748,811.
Jackson, B. Walter: *See—*
Frederickson, Arthur R.; Morris, Arnold D.; and Jackson, B. Walter, 3,749,963.
Jackson, Edgar D., to Steel Web Corporation. Trussed joist structure. 3,748,809, Cl. 52-644.000.
Jackson, Patrick T. Furling and unfurling of sails. 3,749,042, Cl. 114-106.000.
Jaeschke, Ralph L.; Moyer, William H.; and Wiltsey, Howard E., to Eaton Corporation. Electromagnetic friction coupling with ledging prevented means. 3,749,216, Cl. 192-70.140.
Jager, Emil, KG: *See—*
Hans, Jager, 3,749,137.
Jago, Edward John; Eastwood, Fred; and Todish, W. Donald, to Foseco International Limited. Hot topping method. 3,749,148, Cl. 164-33.000.
Jalbert, Domina C. Aerial sled. 3,749,337, Cl. 244-145.000.
James, Maurice L., to Calcatco, Inc. Thermally removable support means 2or loading long vertical vessels. 3,749,258, Cl. 214-17.00c.
Jamet, Jean; and Ponthus, Louis. Alarm device using infrared emission for detection and warning of heat build-up. 3,749,928, Cl. 250-347.000.
Jannjzzi, Frank, Jr. Above-the-ground swimming pool. 3,749,244, Cl. 210-169.000.
Janssen, Leopold Mathieu Lambert. Double-walled partition and partition elements. 3,749,432, Cl. 287-189.36a.
Jasinski, Raymond J.; and Gaines, Lewis H., to Tyco Laboratories, Inc. Lithium batteries having a cathode composition comprising a mixture of nickel sulfide and aluminums. 3,749,607, Cl. 136-83.00r.
Jekiel, Richard J.: *See—*
Burgan, Paul G.; and Jekiel, Richard J., 3,750,138.
Jemison, William, to Heyman Manufacturing Company. Electric cord stress relief combined with a strain relief grommet. 3,749,818, Cl. 174-153.00g.
Jenkins, Robert B., to Chance, A. B., Company. Lock assembly for holding extensible outrigger leg in retracted position. 3,749,430, Cl. 287-58.0ct.
Jensen, Alan K., to Litton Business Systems, Inc. Self-clocking record sensing system. 3,750,108, Cl. 340-172.500.
Jerrold Electronics Corporation: *See—*
Meise, William H.; and Marron, Henry B., 3,750,038.
Jespersen, Paul W., to Georgia-Pacific Corporation. Apparatus for making nonwoven fibrous webs. 3,748,693, Cl. 19-156.300.
Jindai, Hideo, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic control system for operating the blade of a bulldozer. 3,749,181, Cl. 172-803.000.
Johnson, Glenn H., to Hudson Products Corporation. Apparatus for controlling movement between relatively reciprocable bodies. 3,748,918, Cl. 74-242.13a.
Johnson, Irving S., to Lilly, Eli, and Company. Psoriasis treatment. 3,749,784, Cl. 424-262.000.
Johnson, Leslie William: *See—*
Cayton, David Walter; and Johnson, Leslie William, 3,749,035.
Johnson, Philip L. Mechanical jack. 3,749,361, Cl. 254-2.00r.
Johnson, Robert E.: *See—*
Senter, Louis; and Johnson, Robert E., 3,749,450.
Johnson, Robert G.: *See—*
Patrick, Archibald S.; and Johnson, Robert G., 3,748,672.
Johnson Rubber Company, The: *See—*
Satterthwaite, James Glenn, 3,749,464.
Johnson, S. C., & Son, Inc.: *See—*
Kandathil, Thomas V., 3,749,691.
Johnson Service Company: *See—*
Bailey, James R.; Klein, Carl F.; Korta, Lawrence B.; and Pridemore, Donald F., 3,750,165.
Oman, Gary F., 3,750,155.
Johnson, Victor L.: *See—*
Wooten, George W.; Iltis, Rumult; and Johnson, Victor L., 3,749,929.
Johnson, Wade M.; and Ruckle, Robert A., to Continental Oil Company. Stabilized coupler for tractor drawn trailers. 3,749,420, Cl. 280-432.000.
Johnson, William R., Jr.; and Davis, Leonard M., Jr., to Morris, Philip, Incorporated. Microporous vinyl chloride polymers and process for producing. 3,749,685, Cl. 260-2.50m.

Johnston, Ralph D. Fishing rod holder. 3,749,294, Cl. 224-5.00e.

Johnstone, Robert F.; and Balasubramanian, Xodandraman. Two way pulp stock valve. 3,749,114, Cl. 137-244.000.

Jonas, Hans: *See—*
Jonas, Hans; and Stein, Bert, 3,749,900.

Jonas, Hans; and Stein, Bert, to Jonas, Hans. Adjustable flash unit mount. 3,749,900, Cl. 240-1.300.

Jones & Laughlin Steel Corporation: *See—*
Manka, Dan Paul, 3,748,906.

Jones, Bill F.; and Stewart, William J., to Smoot-Holman Company. Incandescent-high intensity discharge lamp lighting system. 3,749,968, Cl. 315-95.000.

Jones, Charles Wright, to Xepex Industries, Inc. Carton and blank for forming carton. 3,749,300, Cl. 229-37.00r.

Jones, Emery Benjamin, to American Coolair Machines. Fan control panel. 3,749,992, Cl. 318-452.000.

Jones, Howard R., Jr.: *See—*
Keyser, Merle D.; and Jones, Howard R., Jr., 3,749,177.

Jones, John Leslie, Sr. Reservoir napkin manufacturing process. 3,749,627, Cl. 156-268.000.

Jones, John Paul; and Nicol, Charles H., to Procter & Gamble Company, The. Bleach-fabric softener compositions. 3,749,673, Cl. 252-95.000.

Jones, John Paul; and Nicol, Charles H., to Procter & Gamble Company, The. Bleach compositions. 3,749,674, Cl. 252-95.000.

Jones, Joseph K.: *See—*
Wilkes, Lambert H.; and Jones, Joseph K., 3,749,003.

Jones, Norman F. Light pen. 3,749,932, Cl. 307-112.000.

Jones, Paul Victor: *See—*
Nangarrow, John; Jones, Paul Victor; and Clark, Peter Stanley, 3,749,628.

Jones, Robert E.; and Niedzwiecki, Richard W., to United States of America, National Aeronautics and Space Administration. Swirl can primary combustor. 3,748,853, Cl. 60-39.650.

Jones, Robert M.; and Rowan, William I., to General Electric Company. Signal divider for speed control of direct reversing gas turbine. 3,749,048, Cl. 115-34.00r.

Jones, Trevor O., to General Motors Corporation. Apparatus for determining when the size of an obstacle in the path of a vehicle is greater than a predetermined minimum. 3,749,918, Cl. 250-208.000.

Jordan, Donald J. Manually operated pump utilizing backpressure for easement of pump stroke. 3,749,524, Cl. 417-323.000.

Joubert, Philippe; and Castel, Yvon, to Institut Francais Du Petrole Des Carburants Et Lubrifiants. Device for maintaining a flexible line under a substantially constant tensile stress. 3,749,367, Cl. 254-189.000.

Joy Manufacturing Company: *See—*
Oakes, Lloyd, 3,749,870.

Joyce, Ronald Stone; and Stoneburner, George Robert, to Calgon Corporation. Adsorbing evaporative emission during fueling of automotive vehicles. 3,748,829, Cl. 55-74.000.

Juba, John T. Sound generating device for signaling and responding to nuisance telephone calls. 3,749,838, Cl. 179-2.000.

Jurgens, Erwin, to Union Special Maschinenfabrik G.m.b.H. Thread-chain cutting device for sewing machines with means for adjusting length of thread remaining on work. 3,749,040, Cl. 112-252.000.

Juvenilia: *See—*
Ract, Bernard, 3,748,667.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Jindai, Hideo, 3,749,181.

Kabushiki Kaisha Koparu: *See—*
Kikuchi, Tomio, 3,748,846.
Wada, Yasuhiro, 3,748,979.

Kabushiki Kaisha Ricoh: *See—*
Suzuki, Minoru, 3,749,009.

Kabushiki Kaisha Saginomiya Seisakusho: *See—*
Odashima, Takeshi; and Makita, takeo, 3,749,307.

Kabushiki Kaisha Suwa Seikosha: *See—*
Goto, Mitsuhiro, 3,750,062.
Kouchi, Akihiko, 3,748,847.

Kabushiki Kaisha Tamura Seisakusho: *See—*
Okano, Kohei, 3,750,073.

Kabushiki Kaisha Yashica: *See—*
Yoshimura, Hirofumi; Takahata, Hisatoshi; Furuhata, Akio; and Nishimura, Susumu, 3,748,978.

Kagele, Frank L.; Meyers, Lavern H.; and Trent, Edward J., to Intercontinental Services, Inc. Keno ticket printer. 3,749,007, Cl. 101-93.00c.

Kaiaoka, Toshimitsu: *See—*
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kaiaoka, Toshimitsu, 3,749,220.

Kaiser, Hermann, to Eaton Corporation. Spring band biased movable contactor for hybrid crash sensor switch. 3,749,863, Cl. 200-61.45r.

Kalamazoo Manufacturing Company, mesne: *See—*
Meschke, Harry H.; and Stewart, William J., 3,749,226.

Kalle Aktiengesellschaft: *See—*
Detmann, Walter; Meid, Gerhard; and Simon, Klaus, 3,749,884.
Schroter, Herbert; and Koblo, Jochen, 3,748,995.

Kalopissis, Gregoire; Bogaut, Andree; and Estradier, Francoise. N-[7-(6-Hydroxy-1-oxa-4-aza-1,2,3,4-tetrahyro) naphthyl] benzoquinonediimines. 3,749,716, Cl. 260-244.00r.

Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. Artificially coloring the skin with tetrazolium salts. 3,749,768, Cl. 424-59.000.

Kalt, Ulrich; and Kung, Rolf, to Aktiengesellschaft Brown, Boveri & Cie. Temperature responsive control switch with bi-metallic disk means. 3,749,865, Cl. 200-83.00r.

Kaltenbach, Pierre. Light detection monitoring device. 3,750,157, Cl. 340-227.00r.

Kamachi, Shin-Ichi, to Olympus Optical Co., Ltd. Division logic circuit. 3,749,890, Cl. 235-92.0cp.

Kamata, Katsuo: *See—*
Kato, Umaki; Endo, Masanori; and Kamata, Katsuo, 3,750,064.

Kamenev, Viktor Sergeevich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Kammann, Karl P., Jr., to Emery Industries, Inc. Oxidation process for the production of fatty acids. 3,749,745, Cl. 260-413.000.

Kampf, Erwin, Maschinenfabrik: *See—*
Schmidt, Willi; Berzbach, Rainer; and Bergen, Klaus, 3,748,704.

Kamstra, Peter: *See—*
Hertzog, Heber T.; and Kamstra, Peter, 3,748,927.

Kan, Ryuzo: *See—*
Hayami, Heijiro; Kan, Ryuzo; and Kawabuchi, Masami, 3,749,836.

Kandathil, Thomas V., to Johnson, S. C., & Son, Inc. Detergent-compatible, fabric-softening compositions. 3,749,691, Cl. 260-29.6xa.

Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.

Kanengieter, Glenn G.; and Barry, Gerald P., to Oivatonna Manufacturing Co., Inc. Automatic hydraulic system for a hay wagon. 3,748,840, Cl. 56-341.000.

Kanoh, Masatoshi: *See—*
Abe, Jinnosuke; Miyauchi, Kango; and Kanoh, Masatoshi, 3,749,580.

Kanou, Kimio: *See—*
Wada, Ryuji; and Kanou, Kimio, 3,748,789.

Kantrud, Gary M.: *See—*
Walker, Frank H.; and Kantrud, Gary M., 3,749,531.

Kao, Chih-Yu, to Bell Telephone Laboratories, Incorporated. Apparatus for suppressing limit cycles due to quantization in digital filters. 3,749,895, Cl. 235-152.000.

Kapitza, Petr Leonidovich. Method and device for producing thermonuclear plasma. 3,749,639, Cl. 176-3.000.

Kaplan, Louis. Frame clamping device. 3,749,349, Cl. 248-488.000.

Kaplan, Robert A.: *See—*
Daly, Richard T.; Kaplan, Robert A.; and Cohen, Martin G., 3,749,476.

Karas, Edwin L.; Lee, Davis S.; and Vanslette, Robert A., to Foxboro Company, The. Sample valve for chromatographic apparatus. 3,748,833, Cl. 55-197.000.

Karas, Nicholas V.: *See—*
Rotman, Walter; and Karas, Nicholas V., 3,750,013.

Karawin, Kenneth J., to Franklin Mint Corporation. Tarnish resistant plating for silver articles. 3,748,712, Cl. 29-199.000.

Karchak, Andre W., Jr.; and Allen, James K. Collapsible wheel chair. 3,749,192, Cl. 180-6.500.

Karplus, Robert; Montgomery, Marshall A.; and Berger, Carl F., to University of California, The Regents of the. Circuit base model. 3,748,755, Cl. 35-19.00a.

Kartridg Pak Co., The: *See—*
Rousseau, Roy S., 3,748,818.

Kason Hardware Corporation: *See—*
Berkowitz, Irving L., 3,748,688.

Kassel, Aaron: *See—*
Lsreeli, Jack; Kassel, Aaron; and Mernyk, Edwin, 3,749,113.

Kato, Kazunobu: *See—*
Ohkubo, Kinji; and Kato, Kazunobu, 3,749,578.

Kato, Mahiko: *See—*
Irie, Yoshihiko; Kato, Mahiko; and Gomi, Kiyondo, 3,748,903.

Kato, Umaki; Endo, Masanori; and Kamata, Katsuo, to Tohoku Metal Industries, Limited. Temperature-operated switch. 3,750,064, Cl. 335-208.000.

Kauffman, Harry D., to Cincinnati Milacron, Inc. Regulator for an EDM power supply. 3,749,876, Cl. 219-69.00c.

Kawabuchi, Masami: *See—*
Hayami, Heijiro; Kan, Ryuzo; and Kawabuchi, Masami, 3,749,836.

Kawada, Takehiko; and Takahashi, Hiroaki, to Denki Onkyo Company, Ltd. Switch devices. 3,749,947, Cl. 310-8.300.

Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, to Technical Research and Development Institute, Kanegafuchi Boseki Kabushiki Kaisha and Nippon Koki Co., Ltd., mesne. Instantaneously completey combustible cartridge case member polyvinyl acetal. 3,749,023, Cl. 102-43.00p.

Kawahara, Kenji: *See—*
Takahashi, Takeshi; Kawahara, Kenji; and Isono, Masao, 3,749,641.

Kawakami, Kenji: *See—*

Miyauchi, Sakae; Tanaka, Kazumitsu; Takayanagi, Shinji; and Kawakami, Kenji, 3,749,821.

Kawamoto, Takashi: *See—*
Aihara, Wataru; and Kawamoto, Takashi, 3,748,707.

Kawamura, Yoshihisa: *See—*
Yagi, Motoi; and Kawamura, Yoshihisa, 3,749,850.

Kazama, Hidemichi: *See—*
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.

Kazama, Toshio; and Sek, Kazunori, to Tamagawa Kikai Kinzoku Kabushiki Kaisha. Prevention of infiltration of gas bubbles into slurry pump. 3,749,522, Cl. 417-54.000.

KDI American Products, Inc.: *See—*
Greene, Nat, 3,749,424.

Kearney, A.T., & Company, Inc.: *See—*
Macomber, Franklin S.; and Hunnicutt, Wayne E., 3,749,268.

Keating, James L., to Rader Companies, Inc. Method and apparatus for forming pulpwood chips. 3,749,323, Cl. 241-28.000.

Keefer, Richard D., to Gelman Instrument Company. Recording and integrator unit. 3,750,187, Cl. 346-49.000.

Kegelman, Thomas D., to United Aircraft Corporation. Image correlating device comprising plural photoconductive layers. 3,749,919, Cl. 250-213.00r.

Keiper, Fritz KG, mesne: *See—*
Strien, Werner; Faust, Eberhard; and Walz, Jurgen, 3,749,443.

Keiser, Le Roy H., to Phillips Petroleum Company. Laminated materials and method of preparation. 3,749,593, Cl. 117-68.000.

Kelch, George W.; Taylor, Bruce J.; and Welcer, Henry A., to United Aircraft Corporation. Blade attachment. 3,749,514, Cl. 416-95.000.

Kellmann, Erik; and Krohn, Rasmus, to Bristol-Myers Company. Hair-setting apparatus having means for moistening the surface of the hair rollers. 3,749,106, Cl. 132-33.000.

Kelso Marine, Inc.: *See—*
Thatcher, Russell S., 3,748,890.

Kemerer, Douglas Wayne, to International Business Machines Corporation. Half good chip with low power dissipation. 3,750,116, Cl. 340-173.0bb.

Kemper, Kate. Apparatus for preparing doughs or similar material. 3,749,373, Cl. 259-185.000.

Kempf, Paul S. Clamshell type optical mounting. 3,749,479, Cl. 350-252.000.

Kempke, William G.: *See—*
Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., 3,749,008.

Kendall Company, The: *See—*
Laakso, Perttu V., 3,749,777.

Kennedy, William S., to Acurex Corporation. Channelizer apparatus. 3,749,225, Cl. 198-31.0aa.

Kerecz, Bela J2, Jr., to Bethlehem Steel Corporation. Laboratory digestion tank. 3,749,245, Cl. 210-180.000.

Kernweis, Nicholas P., to United States of America, Air Force. Suppressed sidelobe equal beamwidth millimeter horn antenna. 3,750,182, Cl. 343-783.000.

Kerr, Walter E. Coin packager. 3,748,824, Cl. 53-213.000.

Keskilohko, Altti Kalervo: *See—*
Bergius, Mikko Hannu Tapani; Saarenketo, Tapio Keikki; and Keskilohko, Altti Kalervo, 3,749,034.

Kesner, Donald R.: *See—*
Barnes, James A.; and Kesner, Donald R., 3,750,142.

Ketterer, Dieter: *See—*
Moller, Tilo; and Ketterer, Dieter, 3,748,959.

Keyes Fibre Company: *See—*
Boursier, Pierre, 3,749,235.

Keyser, Merle D.; and Jones, Howard R., Jr., to Five Star Engineering, Inc. Agricultural implement. 3,749,177, Cl. 172-44.000.

Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic. Device for erection of pressed monolithic lining in underworkings. 3,749,352, Cl. 249-180.000.

Kidde, Walter, & Company Inc., mesne: *See—*
Sterner, Russell L., 3,748,807.

Kieffer, Vernon E., to Emerson Electric Co. Coil insertion device. 3,748,714, Cl. 29-205.000.

Kikuchi, Makoto: *See—*
Asano, Hiroshi; Kikuchi, Makoto; Takeuchi, Hideo; and Kondo, Michimasa, 3,750,008.

Kikuchi, Tomio, to Kabushiki Kaisha Koparu. Time-keeping apparatus. 3,748,846, Cl. 58-26.000.

Kimura, Shuji; and Daitoku, Koichi, to Nippon Kogaku K.K. Motor drive system for camera. 3,748,986, Cl. 95-31.000.

Kinedyne Corporation: *See—*
Brucker, Robert J., 3,749,366.

Kinjo, Hisao; and Akuwa, Fumio, to Victor Company of Japan, Ltd. Endless non-metallic belt for intermittently moving a transducer head transversely across a rotary magnetic disc. 3,749,827, Cl. 178-6.6dd.

Kinney, Alfred W., to Phillips Petroleum Company. Closure having improved resistance to unseating. 3,749,277, Cl. 220-60.00r.

Kinsey, Ernest V. Kite assembly. 3,749,338, Cl. 244-153.00r.

Kioritz Corporation: *See—*
Kobayashi, Torao; and Inaga, Hisashi, 3,749,067.

Kipp, Karl F.: *See—*
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., 3,748,677.

Kissel, William R., to Chrysler Corporation. Electronic ignition controller. 3,749,974, Cl. 315-209.00t.

Kitagima, Isao: *See—*
Ashizawa, Yoshimi; and Kitagima, Isao, 3,748,883.

Kitaj, Walter: *See—*
Hider, Shibley A.; Kitaj, Walter; and Martin, Robert E., 3,749,591.

Kitchin, Nelson L.: *See—*
George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., 3,749,151.

Kiwalle, Jozef: *See—*
Fuller, Francis W.; and Kiwalle, Jozef, 3,748,719.

Klaren, Petrus Jozef. Anchor. 3,749,044, Cl. 114-207.000.

Klein, Carl F.: *See—*
Bailey, James R.; Klein, Carl F.; Korta, Lawrence B.; and Pridemore, Donald F., 3,750,165.

Klein, Theodore J., to United States of America, Army. Linear time dispersive channel decoder. 3,750,145, Cl. 340-347.0dd.

Kleinhenn, Walter H., to United Filtration Corporation. Oven door hinge. 3,749,080, Cl. 126-191.000.

Kline, William M.; and Roach, Charles C., to Medical Evaluation Devices & Instruments Corporation. Spring guide with flexible distal tip. 3,749,086, Cl. 128-2.00m.

Kliphuis, Jans, to Comtech Laboratories, Inc. Position sensing transducer including an electrical wave propagating structure of varying electrical length. 3,749,999, Cl. 318-669.000.

Kloehn, Garth A. Syringe. 3,749,284, Cl. 222-43.000.

Klohr, Robert E. N., to Sherwood Medical Industries Inc. Spirometer mouthpiece. 3,749,087, Cl. 128-2.080.

Knief, Enno A.: *See—*
Winter, Ronald C.; and Knief, Enno A., 3,748,915.

Knight Oil Corporation: *See—*
Ballou, Milton L., 3,748,678.

Knogo Corporation: *See—*
Minasy, Arthur J., 3,748,936.

Knollman, Dieter John Henry; and Simon, James Louis, to Bell Telephone Laboratories, Incorporated. Modular key telephone system having a distributed processor organization. 3,749,848, Cl. 179-99.000.

Knothe, Herbert; Roschmann, Klaus; and Rohwer, Werner, to Teldoc Telefunken-Decca Schallplatten G.m.b.H. Method for improving the centering of stamping matrices for sound and video discs. 3,749,828, Cl. 178-6.60b.

Kobayashi, Torao; and Inaga, Hisashi, to Kioritz Corporation. Two-cycle internal combustion engine. 3,749,067, Cl. 123-73.0af.

Kobayashi, Yugoro, to Ricoh Co., Ltd. Wet developing device for diazo type copying machine. 3,748,996, Cl. 95-89.00a.

Koblo, Jochen: *See—*
Schroter, Herbert; and Koblo, Jochen, 3,748,995.

Kobylar, Alex W.; Lindsay, Robert L.; and Pitroda, Satyan G., to GTE Automatic Electric Laboratories, Incorporated. Modular digital detector circuit arrangement. 3,750,111, Cl. 340-172.500.

Kodaira, Nobuhisa; and Motegi, Norio. Apparatus of driving spinning for false twisting yarn. 3,748,842, Cl. 57-77.450.

Koehring Company: *See—*
Avis, John M., 3,748,839.
Sallberg, David W.; Clark, Peter I.; Parker, Wesley R.; and Nicholson, Robert D., 3,749,128.

Koenig, John R.: *See—*
McKendree, Jesse R., Jr.; and Koenig, John R., 3,748,892.

Koenig, Nathan H.; and Friedman, Mendel, to United States of America, Agriculture. Modification of wool with vinylpyridine and zinc chloride. 3,749,553, Cl. 8-127.600.

Koh, Chuan Seng. Beds. 3,748,666, Cl. 5-61.000.

Kohler, Alfred: *See—*
Schmid, Eckhardt; and Kohler, Alfred, 3,749,431.

Kohoutek, Jindrich; and Near, Charles W., to Hewlett-Packard Company. Binary/BCD arithmetic logic unit. 3,749,899, Cl. 235-176.000.

Koike, Katsumi: *See—*
Nakane, Kazushige; Honmi, Tadashi; and Koike, Katsumi, 3,748,873.

Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich. Electrolyzer for production of magnesium. 3,749,660, Cl. 204-243.00r.

Kolesnikov, Valery Afanasievich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Kolomiitsev, Arnold Vasilievich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery

Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Kolpek, Robert A.; and Stewart, William R., Jr., to International Business Machines Corporation. Dictation system featuring paragraph editing, special notations and sentence extension. 3,749,849, Cl. 179-100.20b.

Koltuniak, Michael A.; Urquhart, Thomas N.; and Case, Leo L., to Controlled Power Corporation. Modular power supply with indirect water cooling. 3,749,981, Cl. 317-100.000.

Komeno, Taichiro, to Shionogi & Co., Ltd. 2,3-Epithic-5α-androst-6-ene compounds. 3,749,778, Cl. 424-241.000.

Komossa, Werner: *See—*
Elsner, Uwe; and Komossa, Werner, 3,748,786.

Kompelien, Arlon D., to Honeywell Inc. Thermostat with projection for thermally isolated switch means. 3,749,934, Cl. 307-117.000.

Konan Camera Laboratory Company, Limited: *See—*
Sakamoto, Isamu, 3,750,186.

Kondo, Michimasa: *See—*
Asano, Hiroshi; Kikuchi, Makoto; Takeuchi, Hideo; and Kondo, Michimasa, 3,750,008.

Kondo, Shigeru: *See—*
Tamura, Toru; Kondo, Shigeru; and Hashimoto, Kozo, 3,750,054.

Kone Osakeyhtio: *See—*
Aro, Erkki, 3,749,326.

Konig, Theodor, to Rose, Walter, KG. Cable testing device for long-distance cables, particularly for occupied cables. 3,749,857, Cl. 179-175.300.

Konig, Wolfgang: *See—*
Geiger, Rolf; Wissmann, Hans; Konig, Wolfgang; and Azadian, Genevieve, nee Boulanger, 3,749,706.

Koomey, Paul C.; Stivers, George S.; and Barker, Theodore R., II, to Global Marine Inc., mesne. Acoustical underwater control apparatus. 3,750,096, Cl. 340-5.00r.

Koppenwallner, Georg, to Fortuna-Werke Maschinenfabrik AG. Control device for a grinding machine. 3,748,788, Cl. 51-165.870.

Koritala, Sambasivarao, to United States of America, Agriculture. Catalyst for selective hydrogenation of polyunsaturated vegetable oils. 3,749,681, Cl. 252-438.000.

Korta, Lawrence B.: *See—*
Bailey, James R.; Klein, Carl F.; Korta, Lawrence B.; and Pridemore, Donald F., 3,750,165.

Kosaeski, Raymond, Jr.: *See—*
Barnes, Charles M.; Kosaeski, Raymond, Jr.; and Putt, James S., 3,750,124.

Kosaka, Yojiro; Uemura, Masaru; and Fujiki, Tokio, to Toyo Soda Manufacturing Co., Ltd. Preparation method of carboxylated polymer. 3,749,756, Cl. 260-878.00r.

Kouchi, Akihiko, to Kabushiki Kaisha Suwa Seikosha. Wrist-watch with selective time-display. 3,748,847, Cl. 58-50.00r.

Kowalski, Daniel G., to Bendix Corporation, The. Interferometric hypsocline generator. 3,749,492, Cl. 356-2.000.

Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, to Shinetsu Chemical Company. Method for preparing hydroxyethylhydroxybutylcellulose. 3,749,710, Cl. 260-231.00a.

Kozbelt, Lloyd S.: *See—*
Vodvarka, Richard T.; and Kozbelt, Lloyd S., 3,749,883.

Krackenberger, Herman F.; and Smith, Daniel J., to Thiokol Chemical Corporation. Solid polyurethane propellant and method of making the same. 3,749,616, Cl. 149-19.000.

Kraft, Kenneth A.: *See—*
Leffler, Edward K.; and Kraft, Kenneth A., 3,748,717.

Kraftco Corporation: *See—*
Borgardt, Henry, 3,748,822.

Kraftwerk Union Aktiengesellschaft: *See—*
Lambrecht, Dietrich; and Weghaupt, Erich, 3,749,952.

Kramer, Justin A. Pneumatic musical instrument. 3,748,945, Cl. 84-330.000.

Kramis, Lawrence E.: *See—*
Griffin, Kenneth Earl, 3,748,680.

Krantz, Quentin R.: *See—*
Tryzna, Charles J.; and Krantz, Quentin R., 3,749,653.

Krapf, John. Bearing mounting method and apparatus. 3,749,463, Cl. 308-236.000.

Krause, Julianne D.: *See—*
Friedman, Robert H.; Krause, Julianne D.; and Bradford, William R., 3,749,174.

Krause, Lothar, to Hauni-Werke Korber & Co., KG. Apparatus for splicing cigarette paper webs. 3,749,634, Cl. 156-505.000.

Kray, William C., Jr.: *See—*
Stephens, Robert D.; and Kray, William C., Jr., 3,749,700.

Kreihe, Hermann. Apparatus for selectively simultaneously cleaning, disinfecting and drying of surfaces. 3,749,502, Cl. 401-139.000.

Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Means for removably affixing cutter bit and lug assemblies to driven elements of a mining machine or the like. 3,749,449, Cl. 299-93.000.

Kreps, Robert W., to Farmland Industries, Inc. Battery testing method employing capacitance and dissipation factor measurements. 3,750,011, Cl. 324-29.500.

Krohn, Rasmus: *See—*
Kellmann, Erik; and Krohn, Rasmus, 3,749,106.

Kropp, Walter: *See—*
Richter, Rudolf; and Kropp, Walter, 3,748,967.

Krueger, Robert K.; Bayne, Peter D.; and Weston, Steven S., to Nutrico, Inc., mesne. Method of sterilizing using cyclopropane carboxylic alkyl carbonic anhydride. 3,749,795, Cl. 424-301.000.

Krumm, Eugene D.: *See—*
Bakker, Lubertus; and Krumm, Eugene D., 3,749,029.

Kucere, Clare H.: *See—*
Hill, Donald G.; Smith, Charles F.; and Kucere, Clare H., 3,749,173.

Kucherenko, Pavel Petrovich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Kucherer, Harvey D. Device for encapsulating a radioactive resin-water slurry. 3,749,917, Cl. 250-430.000.

Kuck, Helmut, to Windmoller & Holscher. Apparatus for collecting and withdrawing stacks of bags delivered by a depositing cylinder. 3,748,973, Cl. 93-93.0dp.

Kuecken, John A., to Radionics, Incorporated. Ground independent antenna. 3,750,181, Cl. 343-790.000.

Kuecken, John A., to International Telephone and Telegraph Corporation. Super-balanced feed-through dipole antenna. 3,750,184, Cl. 343-792.000.

Kuehl, Paul B.: *See—*
Gumbleton, James J.; and Kuehl, Paul B., 3,749,071.

Kuhajek, Eugene J.: *See—*
Andelfinger, George F.; and Kuhajek, Eugene J., 3,749,579.

Kuhn, Edgar, to Bosch, Robert, G.m.b.H. Voltage regulators for alternating current generators. 3,750,006, Cl. 322-28.000.

Kuijk, Karel Elbert; and Hagenbeuk, Henk, to U.S. Philips Corporation. Phase difference measuring device. 3,749,939, Cl. 307-232.000.

Kuiken, Hendrik; and Bergsma, Wytse, to U.S. Philips Corporation. Coupling for shaver drive shaft and cutter. 3,748,731, Cl. 30-436.000.

Kummer, George L., Jr.; and Straw, Ronald A., to Magnaflux Corporation. Pulse ultrasound thickness measuring system having interrogation control. 3,748,895, Cl. 73-67.900.

Kung, Rolf: *See—*
Kalt, Ulrich; and Kung, Rolf, 3,749,865.

Kuniyoshi, Masateru, to Tokyo Shibaura Electric Co., Ltd. Brushless electric motor with damper winding. 3,749,991, Cl. 318-254.000.

Kunkel, Fred: *See—*
Abendroth, Paul; Alix, Hans; Preuss, Friedrich; and Kunkel, Fred, 3,749,011.

Kuo, Mau H. Pippette. 3,748,909, Cl. 73-425.40p.

Kurapoy, Jury Anatolievich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Kurebayashi, Tokuhiro: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; and Ando, Noriyoshi, 3,749,070.

Kurtzman, Ralph H., Jr.; and Schwimmer, Sigmund, to United States of America, Agriculture. Decaffeination of beverages. 3,749,584, Cl. 99-69.000.

Kushima, Kosei; and Yahano, Kanji, to Nippon Steel Corporation. Surface treated steel for the use of forming operation. 3,749,598, Cl. 117-134.000.

Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich. Drilling sem for drilling holes blown-out by pressurized air. 3,749,186, Cl. 175-228.000.

Kuwayama, Shigeo, to Fuji Photo Film Co., Ltd. Method of producing crystalline glass containing portions having different crystallization extents. 3,749,561, Cl. 65-33.000.

Kuzmin, Sergei Vladimirovich. Double beam spectrophotometer. 3,749,497, Cl. 356-93.000.

Kuzmin, Valery Vyacheslavovich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Kylberg, Bengt J.; and Wold, Lars Espen, to Vddeholms Aktibolag. Steel suitable for razor blades. 3,749,568, Cl. 75-126.00c.

Laakso, Perttu V., to Kendall Company, The. Method of supplying phosphate employing N-phosphorylaminoethyl phosphate. 3,749,777, Cl. 424-204.000.

Laberce, Norman. Collapsible garage. 3,749,107, Cl. 135-1.000.

Laberge, David L. Method and apparatus for simultaneously teaching and testing a student. 3,748,754, Cl. 35-48.00r.

Lachmann, Hans-Peter, to Precismeca Gesellschaft fur Fordertechnik mbH. Connecting element for connecting two ends of a conveyor belt. 3,748,698, Cl. 24-38.000.

Ladd Research Industries, Incorporated: *See—*
Porter, John Halsted; and Ladd, William Alexander, 3,749,052.

Ladd, William Alexander: *See—*
Porter, John Halsted; and Ladd, William Alexander, 3,749,052.

Ladish Co.: *See—*
Widera, Otto F., 3,748,887.

Laessar, Claude; and Lambert, Robert, to Ebauches S.A. Day-date timepiece. 3,748,848, Cl. 58-58.000.

Lagain, Georges. Apparatus for cutting out and welding a continuously moving sheath made of thermoplastic material. 3,749,635, Cl. 156-515.000.

Lagerdahl, Sebastian; Mascord, Kenneth; and Maartmann, Sten, to Aktiebolaget Svenska Flaklfabriker. Device for electric precipitator. 3,748,831, Cl. 55-112.000.

Laing, John, Research & Development, Limited: *See—*
Lowen, Michael David; and Mountford, Allan Reginald, 3,750,063.

L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Buffiere, Jean-Pierre, 3,749,155.

Lake Chemical Company: *See—*
Aronberb, Lester; and Lytton, Donald B., 3,749,687.

Lake, Francis K., to Addressograph-Multigraph Corporation. Moisture dispensing unit for lithographic fountain system. 3,749,012, Cl. 101-148.000.

Laman, William H., to International Business Machine Corporation. Security system for article handling apparatus. 3,749,993, Cl. 318-563.000.

Lamb, Walter M. Sanding glove. 3,748,792, Cl. 51-391.000.

Lamberi, Thomas W., to General Electric Company. Transistorized grid pulsing circuit for X-ray tubes and other purposes. 3,749,943, Cl. 307-311.000.

Lambert, Robert: *See—*
Laessar, Claude; and Lambert, Robert, 3,748,848.

Lambert, Robert R., to Air Factors, Inc. Air bar construction for fire resistant suspended ceiling. 3,748,998, Cl. 98-40.00d.

Lambev, Yordan Gueorguiev, to DSO "Cherna Metalurgia i Rudodobiv. Gear-tooth arrangement and transmission incorporating same. 3,748,920, Cl. 74-465.000.

Lambrecht, Dietrich; and Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Rotor for electric machines, particularly turbogenerators. 3,749,952, Cl. 310-54.000.

Lamensdorf, David: *See—*
Ross, Gerald; and Lamensdorf, David, 3,750,125.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Oil tank for rotary piston internal combustion engine with dry sump lubrication. 3,749,074, Cl. 123-196.00r.

Lance, Raymond E., to Construction Technology, Inc. Compactor suspension system. 3,749,506, Cl. 404-133.000.

Landsberger, Kurt. Magnetic stirring element. 3,749,369, Cl. 259-1.00r.

Lange, Karl-Heinz; and Mailander, Manfred, to Balda-Werke. Electrically controlled camera shutter. 3,748,993, Cl. 95-53.0eb.

Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., to Westinghouse Electric Corporation. Heat resistant substrates and battery separators made therefrom. 3,749,604, Cl. 136-20.000.

Langer, Robert Marie Gerard; and Babon, Paulette Aimee, to Epsilon S.A. Oxygen cutting and welding torches. 3,749,320, Cl. 239-416.100.

Langlie, Howard; and Berg, Albert T., Jr. Electric fence insulator. 3,749,820, Cl. 174-163.00f.

Larsen, Ezra B.: *See—*
Bowman, Ronald R.; Larsen, Ezra B.; and Belsher, Donald R., 3,750,017.

Larsen, Ronald L.: *See—*
Gaffney, Bernard J.; and Larsen, Ronald L., 3,749,535.

Lashley, Ronald T., to Emmons Guitar Company, Inc. String mounting and adjustment for steel guitars. 3,748,943, Cl. 84-312.000.

Latham, Allen, Jr., to Haemonetics Corporation. Programmed liquid delivery system. 3,749,285, Cl. 222-58.000.

Lathers, Michael W., to General Motors Corporation. Tailgate. 3,749,440, Cl. 296-51.000.

Latussek, Hans Peter; and Petrak, Heinz, to Siemens Aktiengesellschaft. Guide bearing for use in the housing or bearing plate of a machine or other apparatus. 3,749,457, Cl. 308-58.000.

Lau, Erwin M., to Black Products Company. Bag settler for bag filling machines. 3,749,142, Cl. 141-73.000.

Lauro, Luciano: *See—*
Pomella, Piero; and Lauro, Luciano, 3,749,996.

Laverman, Royce Jay; and Agrawal, Govind M., to Chicago Bridge & Iron Company. Storage tank for liquefied gas having bottom insulation gas shielding. 3,748,865, Cl. 62-50.000.

Lawson, Lonnie Gravely, to Fieldcrest Mills, Inc. Bobbin gear drive for roving frames. 3,748,843, Cl. 57-102.000.

Lazenby, Allan William, to Lucas, Joseph, (Industries) Limited. Solenoid for use in an engine starting mechanism. 3,750,066, Cl. 335-274.000.

Le Blanc, G., Corporation: *See—*
Runde, Robert J., 3,748,946.

Leach, Jack, to Burlington Industries, Inc. Impression fabric made of yarn containing variable shrinkage filaments. 3,749,222, Cl. 197-172.000.

Lear Siegler, Inc.: *See—*
Buscher, Richard G.; and Davis, Richard L., 3,748,749.
Moses, Adrian John, 3,749,942.

Lear Siegler, Inc2: *See—*
Lykken, Lowell O.; and Schulze, Erwin E., Jr., 3,749,333.

Leatherman, Alfred F., to Heller, William C., Jr., mesne. Apparatus and process for printing. 3,749,015, Cl. 101-426.000.

Leathers, Clarence H., to Grant Oil Tool Company. Underreamer having variable arm extension. 3,749,187, Cl. 175-269.000.

Lebras, Louis R.; Christenson, Roger M.; and Zwack, Robert R., to PPG Industries, Inc. Treatment of electrodeposition rinse water. 3,749,657, Cl. 204-181.000.

Ledex Inc.: *See—*
Myers, John L., 3,750,065.

LeDonne, Daniel A., to Plessey Incorporated. Coaxial transmission line RF switch. 3,750,053, Cl. 333-7.000.

Lee, Charles A.; and Furbeck, Warren R., to International Paper Company, mesne. Method of making a bias laid ribbon. 3,749,624, Cl. 156-195.000.

Lee, Dae-Woo, to Honeywell Information Systems, Inc. Address marker encoder in three frequency recording. 3,750,121, Cl. 340-174.160.

Lee, Davis S.: *See—*
Karas, Edwin L.; Lee, Davis S.; and Vanslette, Robert A., 3,748,833.

Lee, Harry W., Jr.: *See—*
Spears, William; and Lee, Harry W., Jr., 3,749,240.

Lee, Jerald D., to Du Pont de Nemours, E. I., and Company. Charged particle energy analysis. 3,749,926, Cl. 250-305.000.

Lee, Raymond, Organization, Inc., The: *See—*
Berg, Norman H., 3,749,118.
Moxey, Harold J., 3,749,164.
Woodfill, Larry R., 3,748,838.

Lee, Raymond, Organization, The: *See—*
Gabryk, Stanislaw, 3,749,510.

Lee, Richard J. Bullet mold with pivotally mounted central mold portion. 3,749,351, Cl. 249-170.000.

Leeds and Micallef: *See—*
Micallef, Lewis A., 3,749,290.

Leenhouts, Albert C., to Superior Electric Company. Method and apparatus for producing digital contour movement on at least three axes. 3,749,995, Cl. 318-570.000.

Lefebvre, Simon, to AKZO Belge S.A. Process and apparatus for fluid-liquid contacting. 3,748,828, Cl. 55-2.000.

Leffler, Edward K.; and Kraft, Kenneth A., to Mohr, John, & Sons. Clip fastener apparatus with magazine feed. 3,748,717, Cl. 29-211.00d.

Lehmann, Gunter; Neunhoeffer, Otto; Roselius, Wilhelm; and Vitzthum, Otto, to HAG Aktiengesellschaft. Treatment of polyamide granules with formic acid. 3,749,698, Cl. 260-78.00s.

Leibowitz, Donald: *See—*
Benyon, Carl W., Jr.; and Leibowitz, Donald, 3,749,984.

Leichliter, Wayne K., to Eaton Corporation. Viscous coupling having an improved coolant system. 3,749,214, Cl. 192-58.00b.

Leimbach, Richard C., to Eaton Corporation. Tiltable aerosol dispensing. 3,749,360, Cl. 254-348.000.

Leitold, Matyas: *See—*
Schmidt, Gunther; Engelhorn, Robert; and Leitold, Matyas, 3,749,785.

Lektromedia Ltd.: *See—*
Carey, Peter M.; and Holmwood, Owen L., 3,750,135.

Lemoine, Jean H., to Compagnie Internationale pour l'Informatique, mesne. Binary coded signal and ciphering and deciphering method and systems embodying same. 3,749,832, Cl. 178-22.000.

Lender, Adam, to GTE Automatic Electric Laboratories, Incorporated. Data transmission employing correlative nonbinary coding where the number of bits per digit is not an integer. 3,750,021, Cl. 325-38.00a.

Lendway, Joseph K.: *See—*
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., 3,748,957.

Lennon, John J., to Nettco Corporation. Shaft sealing system. 3,749,411, Cl. 277-2.000.

Lenz, Henry George, to General Electric Company. Dynamoelectric machine having enhanced cooling. 3,749,950, Cl. 310-45.000.

Leon, Edward; and Shatz, Malcolm H., to Hooker Chemical Corporation. Process for the after-treatment of phosphatized metal articles. 3,749,611, Cl. 148-6.15r.

Leone, Louis William; Morange, Theodore Adam; Reilly, Donald Francis; and Schram, Paul James, to International Business Machines Corporation. Ungated FET method for measuring integrated circuit passivation film charge density. 3,750,018, Cl. 324-158.00t.

Lepelletier, Pierre Andre Georges, to Societe Anonyme Francaise du Ferodo. Hydraulic system for controlling the changing of gear ratios in automotive vehicle transmissions. 3,748,930, Cl. 74-864.000.

Lerouge, Claude Paul Henri: *See—*
Bolus, Daniel; Lerouge, Claude Paul Henri; and Regnier, Marc Andre, 3,750,144.

Lesjofors AB: *See—*
Borup, Alf Lennart; and Hampin, Karl Rune, 3,749,310.

Leute, Richard K.; and Schneider, Richard S., to Syva Corporation. Free radical assay for redox enzymes. 3,749,645, Cl. 195-103.50r.

Lever Brothers Company: *See—*
Cox, Colin John; and Hepburn, John James, 3,749,583.
Tanner, Emil, 3,749,682.

Levin, Howard J.: *See—*
Schneller, George H.; Levin, Howard J.; and Sklar, Stanley, 3,749,779.

Levy, Gabor B.: *See—*
Dahms, Harald; Levy, Gabor B.; and Seltzer, David A., 3,749,659.

Lewis, Keith B.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.

Lezberg, Melvin G. Control for a slitter. 3,748,934, Cl. 82-48.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.

Liddell, Norman E.: *See—*
Siddall, John B.; and Liddell, Norman E., 3,749,743.

Liess, Richard K., to Caterpillar Tractor Company. Multi-flight conveyor for self-loading scrapers. 3,748,759, Cl. 37-8.000.

Life Support, Inc.: *See—*
Thompson, Tommy Lewis, 3,749,678.

Lilly, Eli, and Company: *See—*
Johnson, Irving S., 3,749,784.
Miller, Joseph A., Jr., 3,749,797.

Lime, Bruce J.: *See—*
Cruse, Robert R.; and Lime, Bruce J., 3,749,585.

Lincoln-Hall Research Company: *See—*
Slagle, William E., 3,749,527.

Lind, Hanns: *See—*
Rody, Jean; and Lind, Hanns, 3,749,732.

Lindberg, Charles W., to United States of America, Air Force. Two-stage arming mechanism. 3,749,022, Cl. 102-79.000.

Lindberg, Edward: *See—*
Rait, Joseph M.; Gilmour, Alexander Scott, Jr.; Sellers, Edward C.; and Lindberg, Edward, 3,749,833.

Linde Aktiengesellschaft: *See—*
Richter, Rudolf; and Kropp, Walter, 3,748,967.

Lindeborg, David Georg; and Dahlin, Ake Bertil Ingemar, to Norba Aktiebolag. Apparatus for tilting or overturning a container e.g., for refuse. 3,749,267, Cl. 214-501.000.

Lindquist, Oiva Herbert, to Honeywell Inc. Rate of change of energy indicator. 3,748,900, Cl. 73-178.00r.

Lindsay, Robert L.: *See—*
Kobylar, Alex W.; Lindsay, Robert L.; and Pitroda, Satyan G., 3,750,111.

Lindstrom, Olle B. Disposal of oil spill at sea. 3,749,667, Cl. 210-36.000.

Lingley, Ronald, to Robertson Seals, Inc. Mechanical shaft seal. 3,749,412, Cl. 277-81.00r.

Lingrand, Michel: *See—*
Fauquembergue, Jean G.; Lingrand, Michel; Peltier, Henri; and Chatourel, Pierre, 3,749,153.

Linka, Adolf, to Fouquet-Werk Frauz & Planck. Apparatus forming sheds in looms having continuously progressing sheds. 3,749,135, Cl. 139-13.000.

Lipe Rollway Corporation: *See—*
Bush, Carl D.; and Root, Robert S., 3,749,217.

Liss, Donald H.; and Geiger, Gilbert W., to Textron, Inc. Ball-bearing retainer. 3,749,461, Cl. 308-201.000.

Litchfield, John H.; and Vely, Victor G., to Wrigley, Wm., Jr., Company. Aldehyde-containing anti-caries chewing gum compositions. 3,749,766, Cl. 424-48.000.

Litton Business Systems, Inc.: *Spe—*
Jensen, Alan K., 3,750,108.

Litton Systems, Inc.: *See—*
Logan, J. Robert, 3,749,898.

Lobur, Walter, to Electronic Removal of Metals, Inc. Electrical arc detector. 3,749,877, Cl. 219-69.00s.

Lockerd, Robert M.; Smith, Mark W.; Cooper, Ray E.; and Goode, George E., to Texas Instruments, Incorporated. Modular electronics communication system. 3,750,175, Cl. 343-100.0sa.

Lockwood, William H., Jr.; and Hebert, Hugh P., to Cities Service Oil Company. Method for the improvement of petroleum distillate. 3,749,666, Cl. 208-278.000.

Loev, Bernard, to Smith Kline & French Laboratories. N-cycloalkyl and N-cycloalkanealkylthioamides. 3,749,728, Cl. 260-294.80e.

Lofredo, Anthony; and Goldschmidt, David H., to Airco, Inc. Process for recovery and containment of radioactive gases. 3,748,864, Cl. 62-22.000.

Loftus Engineering Corporation: *See—*
Suydam, Walter, 3,749,550.

Logan, J. Robert, to Litton Systems, Inc. Apparatus for multiplying binary signals based on the binomial theorem. 3,749,898, Cl. 235-164.000.

Lombardi, Raymond P., to Dravo Corporation. Pelletizing apparatus. 3,749,533, Cl. 425-73.000.

Long, George M., to Institute of Gas Technology. Add-on slide gate valve for existing piping. 3,749,108, Cl. 137-15.000.

Long, James A.: *See—*
Bates, David J.; Silzars, Ariz; Roberts, Lester A.; and Long, James A., 3,749,961.

Long, John Albert, to Longford Equipment International Limited. Card scoring device. 3,748,937, Cl. 83-12.000.

Longford Equipment International Limited: *See—*
Long, John Albert, 3,748,937.

Loomis, Robert Jewelle; and Rensink, Chester William, to Freuhauf Corporation. Twist lock. 3,749,438, Cl. 294-81.0sf.

Loose, Guenther H., to Eastman Kodak Company. Method of and apparatus for ultrasonically embossing a sheet of malleable material. 3,749,006, Cl. 101-3.00r.

Loose, Winfield Warren: *See—*
Tiazkun, Michael George; and Loose, Winfield Warren, 3,749,866.

Lorain Products Corporation: *See—*
Dolamore, Charles D., 3,749,941.

Lord, Thomas J.: *See—*
Fernandes, Joseph F.; Pfouts, Robert R.; and Lord, Thomas J., 3,749,308.

Lorenzi, Dodds and Gunnill: *See—*
Lorenzi, Silvio J.; Dodds, Robert M.; and Gunnill, Edward F., 3,748,794.

Lorenzi, Silvio J.; Dodds, Robert M.; and Gunnill, Edward F., to Lorenzi, Dodds and Gunnill. Building construction and method. 3,748,794, Cl. 52-79.000.

Loria, Anthony, to Eastman Kodak Company. 4-Imido-substituted-1-hydroxy-2-naphthamides. 3,749,735, Cl. 260-326.00n.

Love, John J.; and Smith, Carl A., to Emerson Electric Co. Diaphragm gas valve with adjustable opening speed. 3,749,120, Cl. 137-489.500.

Lowe, Barrie. Audio-sensitive devices. 3,749,483, Cl. 353-15.000.

Lowen, Michael David; and Mountford, Allan Reginald, to Laing, John, Research & Development, Limited. Laying of concrete kerbs, haunches and the like. 3,750,063, Cl. 335-206.000.

Lsreeli, Jack; Kassel, Aaron; and Mernyk, Edwin, to Technicon Instruments Corporation. Flow regulator for controlling ultra-low volumetric flow rates. 3,749,113, Cl. 137-209.000.

LTV Aerospace Corporation, mesne: *See—*
Giraud, Francois L., 3,749,025.

Lucas, Joseph, (Industries) Limited: *See—*
Lazenby, Allan William, 3,750,066.

Lucas, Paul G., to Gordon Engineering Company. Capacitively coupled reference signal and associated circuitry particularly for analog to digital, digital to analog converters and the like. 3,750,146, Cl. 340-347.0ad.

Lucky, Zalton J.: *See—*
Wong, Alfred Y.; Nuding, James M.; and Lucky, Zalton J., 3,750,137.

Luder, Ernst; and Buzzi, Gunther, to Grohe, Hans KG, Firma. Rod supported shower slide with eccentric clamp. 3,749,345, Cl. 248-230.000.

Ludman, Jacques E., to United States of America, Air Force. Window for high power gaseous lasers. 3,750,048, Cl. 331-94.500.

Ludoshnikov, Valentin Mikhailovich. Horizontal coordinate boring machine. 3,749,509, Cl. 408-234.000.

Ludwig, Frank; Bannehr, Konrad; Rothe, Dieter; and Tschischke, Werner, to VEB Wirkmaschinenbau Karl-Marx-Stadt. Apparatus for controlling pattern drums particularly in circular knitting machine. 3,748,871, Cl. 66-50.00b.

Ludwig, Rolf: *See—*
Dettke, Manfred; Ludwig, Rolf; and Riedel, Wolfgang, 3,749,650.

Ludwigsburger Maschinenbau GmbH: *See—*
Schukrafft, Friedrich, 3,749,508.

Luebrecht, Richard E., to Westinghouse Electric Corporation. Undervoltage sensing circuit. 3,749,944, Cl. 307-235.00r.

Luedorf, Carl & Company: *See—*
Rath, Ewald, 3,749,139.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 3,749,213.

Lund, Robert K.: *See—*
Dorsey, Edward G., Jr.; Peterson, John A.; and Lund, Robert K., 3,749,615.

Lutchansky, Milton: *See—*
Bankert, Jon Calvin, Jr.; Lutchansky, Milton; Osifchin, Nicholas; and Willis, Clarence Jesse, 3,750,058.

Lute, Lawrence R. Electrical indicator. 3,750,130, Cl. 340-267.00c.

Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, to Siemens Aktiengesellschaft. Inscribing device. 3,749,868, Cl. 346-23.000.

Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., to United States of America, Agriculture. Lubricants for hides and leather. 3,749,669, Cl. 252-8.570.

Luzaich, Samuel: *See—*
Burlong, Donn B.; and Luzaich, Samuel, 3,749,381.

Lykken, Lowell O.; and Schulze, Erwin E., Jr., to Lear Siegler, Inc2. Dead reckoning back-up navigational system for a drone. 3,749,333, Cl. 244-3.150.

Lynch, Charles R.: *See—*
White, William D.; and Lynch, Charles R., 3,748,894.

Lynch, Frank T. Tool bit holder. 3,748,710, Cl. 29-96.00r.

Lynn, Buddy E. Beam supporting device as lifting tongs, for attachment to cable of cranes. 3,749,437, Cl. 294-67.0aa.

Lynn, James D. Refuse can holder. 3,749,414, Cl. 280-47.190.

Lyon, Richard L. Alloy for dental use. 3,749,570, Cl. 75-171.000.

Lytton, Donald B.: *See—*
Aronberb, Lester; and Lytton, Donald B., 3,749,687.

M & T Chemicals, Inc.: *See—*
Valayil, Silvester P., 3,749,649.

Maartmann, Sten: *See—*
Lagerdahl, Sebastian; Mascord, Kenneth; and Maartmann, Sten, 3,748,831.

Macintosh, Charles. Foldable grandstand. 3,748,798, Cl. 52-10.000.

Macomber, Franklin S.; and Hunnicutt, Wayne E., to Kearney, A.T., & Company, Inc. Automatic freight handling apparatus for highway trailers. 3,749,268, Cl. 214-516.000.

Macovski, Albert, to Stanford Research Institute. Method and apparatus for producing a coutour map of a surface area. 3,749,493, Cl. 356-2.000.

MacPherson, James R.: *See—*
Hancock, Earl A.; and MacPherson, James R., 3,749,019.

Macrander, Max S., to GTE Automatic Electric Laboratories, Incorporated. Amplifying junctor circuit. 3,749,856, Cl. 179-170.00g.

Mader, William G.: *See—*
Folkenroth, Richard P.; and Mader, William G., 3,749,371.

Maeda, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Induction type telemetering system. 3,750,122, Cl. 340-196.000.

Magaldi, Paolo. Protected belt conveyor. 3,749,228, Cl. 198-1402000.

Magnaflux Corporation: *See—*
Kummer, George L., Jr.; and Straw, Ronald A., 3,748,895.

Magner, James E.: *See—*
Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., 3,749,764.

Magyar Hajo-es Darugyar: *See—*
Szabo, Josef; and Szucs, Laszlo, 3,749,158.

Mahorney, Kenneth R.: *See—*
Eineck, Mathew F.; and Mahorney, Kenneth R., 3,749,005.

Maier, Gerhard. Wood chip cutting machine. 3,749,325, Cl. 241-86.000.

Mailander, Manfred: *See—*
Lange, Karl-Heinz; and Mailander, Manfred, 3,748,993.

Maillocheau, Camille Jean, to Societe a Responsabilite Limitee dite: Royoda. Clip hook for fastening devices such as spiders for securing objects onto luggage carriers. 3,748,703, Cl. 24-265.0sh.

Maitrias, Gerard: *See—*
Diepart, Paul; Gransart, Philippe; and Maitrias, Gerard, 3,749,940.

Makita, takeo: *See—*
Odashima, Takeshi; and Makita, takeo, 3,749,307.

Mallard, John, to Warren, F. J., Limited. Method of producing an irridescent pattern on the surface of a sheet or other object and sheets or objects having patterned surface produced by this method. 3,749,471, Cl. 350-109.000.

Maly, George P.: *See—*
Fischer, Paul W.; Maly, George P.; and Pyle, Delbert E., 3,749,554.

Mandel, Lewis R., to Merck & Co., Inc. Pharmaceutical composition and method of treatment. 3,749,781, Cl. 424-251.000.

Manka, Dan Paul, to Jones & Laughlin Steel Corporation. Gas sampling apparatus. 3,748,906, Cl. 73-421.500.

Mankowsky, Vincent J. Lock nut assemblies. 3,749,433, Cl. 287-189.36f.

Manly, Ron. Method and apparatus of editing using colored editing marks. 3,750,112, Cl. 340-172.500.

Mansdorf, Seymour Zachary: *See—*
Cardarelli, Nathan F.; and Mansdorf, Seymour Zachary, 3,749,772.

Marancik, William G.: *See—*
Gregory, Eric; Marancik, William G.; and Shattes, Walter J., 3,749,547.

Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, to Bertin & Cie and Entreprise de Recherches et d'Activites Petrolieres Elf. Mass separator. 3,748,826, Cl. 55-17.000.

Marchand, Georges: *See—*
Clech, Albert; Marchand, Georges; and Pasquiou, Jean-Yves, 3,749,370.

Marchese, Louie J.; and Hildebrandt, Robert A. Clamp assembly for hose, pipe and like articles. 3,748,697, Cl. 24-19.000.

Marcona Corporation: *See—*
Robinson, Charles W.; Merklin, Kenneth E.; and Wood, William P., 3,749,314.

Marconi Company, Limited, The: *See—*
Ellis, Alfred Brian Edwin, 3,749,834.

Marcucci, Ronald R.; and Galatioto, Santo C., to Hazeltine Corporation. System for determining whether a signal lies within a selected frequency band. 3,750,034, Cl. 328-110.000.

Marhoff, Paul: *See—*
Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, 3,749,868.

Markant, Henry P.: *See—*
Strom, Steven S.; and Markant, Henry P., 3,749,380.

Markiewicz, Bernard Frank: *See—*
Ellis, Donovan Russell, Jr.; and Markiewicz, Bernard Frank, 3,749,271.

Marlow, Jerry R.: *See—*
Schaefer, Robert H.; and Marlow, Jerry R., 3,748,931.

Marron, Henry B.: *See—*
Meise, William H.; and Marron, Henry B., 3,750,038.

Marschak, Howard J. Means for connecting adjacent railings to a post to 2orm a support for forming a bookcase, shelving, or the like. 3,749,343, Cl. 248-188.000.

Martell, Dennis J., to Northern Illinois Gas Company. Docoder circuits for shaft encoder apparatus. 3,750,156, Cl. 340-203.000.

Martin, John Terry; Remmington, John Elstow; and Bedford, John, to Ferranti Limited. Data transfer systems. 3,750,110, Cl. 340-172.500.

Martin, Macklin F. Fastener. 3,748,696, Cl. 24-16.0pb.

Martin, Robert E.: *See—*
Hider, Shibley A.; Kitaj, Walter; and Martin, Robert E., 3,749,591.

Martin, Tellis A., to Mead Johnson & Company. Compositions containing zinc mercaptide N-acetylcysteine carboxylate salts. 3,749,770, Cl. 424-72.000.

Marx, John W., to Phillips Petroleum Company. Decreasing the permeability of subterranean formations. 3,749,171, Cl. 166-274.000.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Siloxane modified polyester fiber containing elastomer. 3,749,757, Cl. 260-824.000.

Mascord, Kenneth: *See—*
Lagerdahl, Sebastian; Mascord, Kenneth; and Maartmann, Sten, 3,748,831.

Mason, Jimmie L.: *See—*
Prussi2, Samuel; and Mason, Jimmie L., 3,749,291.

Massachusetts Institute of Technology: *See—*
Wilson, David G., 3,749,219.

Materials Research Corporation: *See—*
Biehl, Richard E., 3,749,662.

Materiel Applications Plastiques: *See—*
Pierre, Marcel J., 3,749,396.

Mathes, William T., Jr. Middle ear inflator. 3,749,083, Cl. 128-1.00r.

Mathews, Thomas R. Bike security device. 3,748,876, Cl. 70-18.000.

Matsubara, Hironaga: *See—*
Shiga, Tetsuya; Inagaki, Yutaka; and Matsubara, Hironaga, 3,749,817.

Matsuchita Electric Industrial Co., Ltd.: *See—*
Fujimoto, Kyohei; and Tamura, Katsuhiko, 3,750,180.

Matsumoto Chemical Industry Co., Ltd.: *See—*
Sugiyama, Iwakichi; and Tomozuka, Haruki, 3,749,769.

Matsumoto, Seiji: *See—*
Sato, Masamichi; Matsumoto, Seiji; Fukushima, Osamu; and Honjo, Satoru, 3,749,927.

Matsumura, Kenichi: *See—*
Sugano, Kumakichi; and Matsumura, Kenichi, 3,749,033.

Matsuno, Suguru: *See—*
Yamamoto, Yasuhiko; Shimada, Sugao; and Matsuno, Suguru, 3,749,468.

Matsushita Electric Industrial Co., Ltd.: *See—*
Arimura, Ichiro, 3,749,826.
Arimura, Ichiro; Taniguchi, Hiroshi; and Tanaka, Hiromichi, 3,749,835.
Hayami, Heijiro; Kan, Ryuzo; and Kawabuchi, Masami, 3,749,836.
Mifune, Hideo; and Tani, Kenroku, 3,749,854.
Sagishima, Takayuki; Sasaki, Reiichi; and Nagaoka, Yoshitomi, 3,749,824.
Tamura, Toru; Kondo, Shigeru; and Hashimoto, Kozo, 3,750,054.
Uchida, Kosaku, 3,750,028.

Matsuzaki, Akio; Tsuruoka, Kanzi; Sada, Tetuo; and Onishi, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Process for selecting an o2f-size material during travel. 3,749,241, Cl. 209-82.000.

Mattel, Inc.: *See—*
Bass, Sidney; Benson, John T.; and Shirwo, Darold M., 3,748,765.
Nelson, Carl S., Jr., 3,749,808.

Matthews, David Ernest, 4 D Research & Development Company Limited. Apparatus for the production of sheets or films from liquid material having poor mechanical stability and not susceptible of being directly pumped. 3,749,534, Cl. 425-92.000.

Matthews, Richard A.: *See—*
Petersen, Harold E.; and Matthews, Richard A., 3,750,003.

Mattingly, Charles D., to Mattingly, Inc. Method of swimming pool manufacture. 3,748,810, Cl. 52-742.000.

Mattingly, Inc.: *See—*
Mattingly, Charles D., 3,748,810.

Matty, Thomas C., to Westinghouse Electric Corporation. Speed control system. 3,749,994, Cl. 318-563.000.

Matuzaki, Tetuo; Nakamura, Toshio; and Egawa, Hitoshi, to Hitachi, Ltd. Antifriction bearing assembly for electric motors. 3,749,459, Cl. 308-187.000.

Maucher, Paul, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch assembly. 3,749,213, Cl. 192-48.800.

Maulding, Donald Roy, to American Cyanamid Company. Chemiluminescent reaction of substituted 2,2,3,3-tetrachloro-1,4-benzodioxane. 3,749,677, Cl. 252-188.3cl.

Maurer, Barbara V.: *See—*
Haugwitz, Rudiger D.; Maurer, Barbara V.; and Narayanan, Venkatachala L., 3,749,717.

Maxfield, Frank L.; and Trimble, Roger B., to Stromberg Datagraphix, Inc. Microfiche duplicator. 3,749,491, Cl. 355-106.000.

Mayall, William. Pressurized sealing means for a hydraulic turbodrill. 3,749,511, Cl. 415-113.000.

Mayer, David P.: *See—*
Richter, Sidney B.; and Mayer, David P., 3,749,796.

Mayer, Georg, to Mayer KG. Device for filling of containers, particularly bags, with loose material. 3,748,823, Cl. 53-187.000.

Mayer KG: *See—*
Mayer, Georg, 3,748,823.

Mayer, Rudolf; Sakautzki, Hans; and Volkheimer, Lothar, to Hopt Electronic GmbH. Tuning device for radio-frequency communications equipment. 3,750,031, Cl. 325-452.000.

Mc Nutt, Charles R.: *See—*
Dore, James E.; and Mc Nutt, Charles R., 3,749,152.

McCain Manufacturing Corp.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,749,394.

McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., to McCain Manufacturing Corp. Folding machines. 3,749,394, Cl. 270-80.000.

McCarty, John R., to Firestone Tire & Rubber Company, The. Method and apparatus for recording information on and retrieving information from a pneumatic tire. 3,750,120, Cl. 340-174.10k.

McClellan, Walter R. Insulation stripper for conductors. 3,748,733, Cl. 30-90.100.

McClenahan, Douglas S., to Charter Arms Corporation. Adjustable rear sight for handguns. 3,748,744, Cl. 33-257.000.

McCloskey, Edward W. Remote, completely self-contained, self-maintaining power supply apparatus for powering a pressurized-liquid distributing and disseminating system. 3,750,001, Cl. 320-61.000.

McCorkle, William C., Jr., to United States of America, Army. Attitude compensating missle system. 3,749,334, Cl. 4-4-66.

McCormick, William J., Jr., to Glendinning Companies, Inc. Container for hand tools. 3,749,233, Cl. 206-16.00r.

McCulloch Corporation: *See—*
Fidler, Robert Charles, 3,748,716.

McDonnell Douglas Corporation: *See—*
Fannin, Eugene R.; and Gumbelevicius, John, 3,749,618.
Fountain, Roger; and McLaughlin, Gregory M., 3,749,617.
Osofsky, Irving B., 3,749,317.
Waters, Elmer D., 3,749,163.

McFadyen, Robert J.: *See—*
Peil, William; and McFadyen, Robert J., 3,750,042.

McGeehan, Michael T.: *See—*
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., 3,748,957.

McKendree, Jesse R., Jr.; and Koenig, John R., to United States of America, Air Force. High precision dilatometer. 3,748,892, Cl. 73-16.000.

McLaughlin, Gregory M.: *See—*
Fountain, Roger; and McLaughlin, Gregory M., 3,749,617.

McMenim, Michael Edward: *See—*
Clark, James; McMenim, Michael Edward; and Rose, Francis Leslie, 3,749,719.

Mead Johnson & Company: *See—*
Martin, Tellis A., 3,749,770.

Medellin, Daniel: *See—*
Pizzarello, Frank A.; and Medellin, Daniel, 3,748,790.

Medi-Physics, Inc.: *See—*
Barak, Morton; and Winchell, Harry S., 3,749,556.

Medical Evaluation Devices & Instruments Corporation: *See—*
Kline, William M.; and Roach, Charles C., 3,749,086.

Medspec, Inc.: *See—*
Cotey, John, 3,749,099.

Meeks, Frederick T., to General Electric Company. Apparatus for heating flowable material. 3,749,880, Cl. 219-214.000.

Meeussen, Louis Achilles, to Agfa-Gevaert N.V. Apparatus for reading out information data. 3,749,922, Cl. 250-219.00d.

Mefferd, Wayne S.: *See—*
Dowley, Mark W.; Mefferd, Wayne S.; and Rorden, Robert J., 3,750,049.

Mehnert, Johannes. Apparatus for the production of blow molded plastic articles. 3,749,541, Cl. 425-326.000.

Meid, Gerhard: *See—*
Detmann, Walter; Meid, Gerhard; and Simon, Klaus, 3,749,884.

Meier, Johann. Adjustable bearing. 3,749,455, Cl. 308-6.00r.

Meijeb, Roelf Jan, to U.S. Philips Corporation. Heat transporting device. 3,749,159, Cl. 165-105.000.

Meise, William H.; and Marron, Henry B., to Jerrold Electronics Corporation. Amplifier circuit for coincidentally providing signal clamping operation. 3,750,038, Cl. 330-11.000.

Melberg, Robert C.: *See—*
Brockett, Halford E.; and Melberg, Robert C., 3,749,272.

Mele, Sidney C.; and Hoyt, Earl, to Blessings, Inc. Receptacle with spring hinge closure. 2,749,274, Cl. 220-31.000.

Melnikov, Ivan Iosifovich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Melton, Francis W.: *See—*
Austin, Charles W.; and Melton, Francis W., 3,749,403.

Mentone, Pat F., to Buckbee-Mears Company. Rigidized printing screen. 3,749,010, Cl. 101-127.000.

Merck & Co., Inc.: *See—*
Fisher, Michael H., 3,749,789.
Hannah, John; Graham, Donald W.; and Rogers, Edward F., 3,749,734.
Hinkley, David F., 3,749,680.
Mandel, Lewis R., 3,749,781.

Merger, Franz; Fuchs, Werner; and Dockner, Toni, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 2,2-dialkyl-3-acyloxypropanals. 3,749,749, Cl. 260-468.00r.

Merklin, Kenneth E.: *See—*
Robinson, Charles W.; Merklin, Kenneth E.; and Wood, William P., 3,749,314.

Merlin Gerin, Societe Anonyme: *See—*
Payen, Jean-Pol, 3,749,858.

Mernyk, Edwin: *See—*
Lsreeli, Jack; Kassel, Aaron; and Mernyk, Edwin, 3,749,113.

Meschke, Harry H.; and Stewart, William J., to Kalamazoo Manufacturing Company, mesne. Device for changing grids from successive flat arrangement to parallel perpendicular arrangement. 3,749,226, Cl. 198-33.0ad.

Metalectric, Inc.: *See—*
Tryzna, Charles J.; and Krantz, Quentin R., 3,749,653.

Meyer, Leonard S. Portable stand adapted for tree mounting. 3,749,200, Cl. 182-187.000.

Meyer, Theodore R.; and Boyajian, Myron J., to Allis-Chalmers Corporation. Seat brake with toggle linkage. 3,749,207, Cl. 188-109.000.

Meyers, Lavern H.: *See—*
Kagele, Frank L.; Meyers, Lavern H.; and Trent, Edward J., 3,749,007.

Meyers, Phyllis L. Scrub dress. 3,748,659, Cl. 2-74.000.

Micallef, Lewis A., to Leeds and Micallef. Trigger actuated pump. 3,749,290, Cl. 222-385.000.

Michaelsen, Dwight W., to Dale Electronics, Inc. Electrical heating pad. 3,749,886, Cl. 219-528.000.

Mickelson, Grant A., to Union Oil Company of California. Hydrogenative hydrocarbon conversion. 3,749,663, Cl. 208-110.000.

Mickelson, Grant A., to Union Oil Company of California. Hydrogenative denitrogenation. 3,749,664, Cl. 208-254.00h.

Micklewright, Donald G., to Standard Oil Company. Apparatus for stripping solvent from and dehydrating trimellitic acid content of fluid effluent from catalytic liquid phase oxidation of pseudocumene in presence of acetic acid. 3,749,647, Cl. 202-153.000.

Microsystems International Limited: *See—*
Dupuis, Jean M., 3,748,725.

Midland-Ross Corporation: *See—*
Beggs, Donald; and Barston, William T., 3,749,386.

Midland-Ross Corporatio2: *See—*
Christensen, Eric A.; and Schilling, Robert W., 3,749,336.

Mifune, Hideo; and Tani, Kenroku, to Matsushita Electric Industrial Co., Ltd. Ultrasonic wave microphone. 3,749,854, Cl. 179-110.00a.

Mihelic, Edward L.; and Morgan, Marcus S., to United States Steel Corporation. Modified coal-tar-pitch compositions and process for preparing same. 3,749,688, Cl. 260-28.000.

Mikheev, Igor Grigorievich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

Mikulski, Walter E., to United Aircraft Corporation. Method for electrolytically machining holes in hollow articles. 3,749,654, Cl. 204-129.650.

Mikuteit, Seigfried: *See—*
Gehman, John B.; Herlich, Gilbert A.; and Mikuteit, Seigfried, 3,750,167.

Miller, Allen R.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,749,505.

Miller, Arthur J.: *See—*
Miller, Robert A.; and Miller, Arthur J., 3,749,512.

Miller, Charles P.; Miller, Allen R.; and Miller, David J., to Miller Formless Co., Inc. Concrete curb laying machine. 3,749,505, Cl. 404-98.000.

Miller, David J.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,749,505.

Miller, Eric; and Miller, Robert Eric, to Miller, R. E., Pty. Limited. Mounting assembly. 3,749,208, Cl. 188-271.000.

Miller Formless Co., Inc.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,749,505.

Miller, Frank L.: *See—*
Scocos, Peter C.; and Miller, Frank L., 3,749,692.

Miller, Jack L., to CTS Corporation. Wirewound variable resistance control and method of making the same. 3,750,081, Cl. 338-174.000.

Miller, Joseph A., Jr., to Lilly, Eli, and Company. Analgesic compositions. 3,749,797, Cl. 424-308.000.

Miller, Kenneth J.; and Patton, Eugene K., to Caterpillar Tractor Company. Apparatus for deforming sheet material. 3,748,889, Cl. 72-382.000.

Miller, R. E., Pty. Limited: *See—*
Miller, Eric; and Miller, Robert Eric, 3,749,208.

Miller, Richard Carrel: *See—*
Burus, Harry Shaner; Miller, Richard Carrel; and Sautter, Helmuth Otto, 3,749,829.

Miller, Richard G. Hinged loop cap member. 3,749,368, Cl. 256-11.000.

Miller, Robert A.; and Miller, Arthur J., to Carrier Corporation. Inlet structure for turbo machine. 3,749,512, Cl. 415-136.000.

Miller, Robert Eric: *See—*
Miller, Eric; and Miller, Robert Eric, 3,749,208.

Mills, Stephen D. Golf putter. 3,749,408, Cl. 273-171.000.

Milton, Thomas J.: *See—*
Farrell, Robert C.; Skelley, John W.; Milton, Thomas J.; and Piziks, Henry I., 3,748,921.

Mimoto, Hiroshi: *See—*
Sakita, Takashi; Ebisawa, Masaaki; and Mimoto, Hiroshi, 3,749,581.

Minasy, Arthur J., to Knogo Corporation. Method and apparatus for detachment of fasteners. 3,748,936, Cl. 83-162.000.

Mindel, Gunter, to Rheinmetall G.m.b.H. Firing-rate and rhythm control apparatus for automatic weapons. 3,748,960, Cl. 89-135.000.

Minnesota Mining and Manufacturing Company: *See—*
Bradshaw, Thomas Ian; and Tamsky, Morgan J., 3,748,777.
Fayling, Richard E., 3,750,083.

Misjura, Rostislav Spiridonovich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasielevich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Mitchell, James E.: *See—*
Alms, Erhard E.; and Mitchell, James E., 3,749,551.

Mitchell, James W., to General Electric Company. Ammunition high voltage electrical ignition system. 3,748,770, Cl. 42-84.000.

Mitsche, Roy T.: *See—*
Pollitzer, Ernest L.; and Mitsche, Roy T., 3,749,752.

Mitsuashi, Ken Ichi: *See—*
Usui, Keizaburo; Mitsuashi, Ken Ichi; and Yamaguchi, Michio, 3,749,419.

Mitsubishi Denk Kabushiki Kaisha: *See—*
Imataki, Mitsumasa, 3,749,869.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Asano, Hiroshi; Kikuchi, Makoto; Takeuchi, Hideo; and Kondo, Michimasa, 3,750,008.
Maeda, Yoshio, 3,750,122.
Ueda, Atsushi, 3,750,100.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Tamaru, Shigeo; and Teshima, Kiyumi, 3,749,047.

Miyashiro, Shoichi; Ogawa, Kazuyuki; and Hori, Hiroo, to Tokyo Shibaura Electric Co., Ltd. Gas discharge display apparatus. 3,749,969, Cl. 315-169.0tv.

Miyata Electric Works, Inc.: *See—*
Ban, Itsuki, 3,748,989.

Miyauchi, Kango: *See—*
Abe, Jinnosuke; Miyauchi, Kango; and Kanoh, Masatoshi, 3,749,580.

Miyauchi, Sakae; Tanaka, Kazumitsu; Takayanagi, Shinji; and Kawakami, Kenji, to Nihon Denshi Kabushiki Kaisha. System for recording and reproducing a plurality of signals. 3,749,821, Cl. 178-5.20d.

Moffett, Ray H.: *See—*
Moxey, Harold J., 3,749,164.

Mohon, Windell N.: *See—*
Breglia, Denis R.; Rodemann, Alfred H.; and Mohon, Windell N., 3,748,751.

Mohr, John, & Sons: *See—*
Leffler, Edward K.; and Kraft, Kenneth A., 3,748,717.

Mohri, Yohichi; and Ishizaki, Masayuki, to Nissan Motor Company, Limited. Line pressure control system for automatic power transmission. 3,748,926, Cl. 74-645.000.

Molex Incorporated: *See—*
Bury, Allen J., 3,750,092.

Moller, Tilo; and Ketterer, Dieter, to Heckler & Koch GmbH. Breech block buffer. 3,748,959, Cl. 89-132.000.

Monitor Labs, Inc.: *See—*
Wilkins, Paul E.; and Budd, Allan L., 3,749,495.

Monsanto Company: *See—*
Berkau, Eugene E., 3,749,696.
Crutchfield, Marvin M., 3,749,676.
Fraleigh, Marion Foster; and Wise, Raleigh Warren, 3,748,841.
Reichard, Thomas E.; and Bever, Thomas L., 3,749,499.
Shelby, Richard, 3,749,542.

Monsanto Research Corporation: *See—*
Wooten, George W.; Iltis, Rumult; and Johnson, Victor L., 3,749,929.

Montecatini Edison S.p.A.: *See—*
Cantatore, Giuseppe; and Branchesi, Millo, 3,749,694.

Montesi, Robert Paul, to Dresser Industries, Inc. Valve seat construction. 3,749,359, Cl. 251-306.000.

Montgomery, James Boring: *See—*
Addison, Frank E., 3,749,126.

Montgomery, Marshall A.: *See—*
Karplus, Robert; Montgomery, Marshall A.; and Berger, Carl F., 3,748,755.

Montgomery, Neal R., to Amoco Production Company. Process for producing sulfur from sour gas. 3,749,762, Cl. 423-574.000.

Montgomery, William Herbert, to American Cyanamid Company. Package for plural reactable components with rupturable ultrasonic seal. 3,749,620, Cl. 156-73.000.

Moore, George L.: *See—*
Terrell, Ross C.; and Moore, George L., 3,749,791.
Terrell, Ross C.; and Moore, George L., 3,749,793.
Terrell, Ross C.; and Moore, George L., 3,749,794.

Moore, John H., to Zenith Radio Corporation. Automatic hue control circuit. 3,749,825, Cl. 178-5.4he.

Moore, Thomas J., to United States of America, National Aeronautics and Space Administration. Production of hollow components for rolling element bearings by diffusion welding. 3,748,722, Cl. 29-487.000.

Morange, Theodore Adam: *See—*
Leone, Louis William; Morange, Theodore Adam; Reilly, Donald Francis; and Schram, Paul James, 3,750,018.

Mordchelles Regnier, Georges: *See—*
Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, 3,748,826.

Morgan, Charles L.: *See—*
Carter, Andrew G.; and Morgan, Charles L., 3,749,485.

Morgan Construction Company: *See—*
Hill, William J.; Starvaski, Raymond R.; and Woodrow, Harold E., 3,749,256.

Morgan, Marcus S.: *See—*
Mihelic, Edward L.; and Morgan, Marcus S., 3,749,688.

Morita, Akio, to Scny Corporation. System for maintaining acceptable environmental conditions in an indoor swimming pool enclosure. 3,748,664, Cl. 4-172.140.

Moriya, Shozo; Ohta, Shoji; Iwawaki, Yasutaka; and Usui, Yukio, to Canon Kabushiki Kaisha. Magnetic recording-reproducing device. 3,749,852, Cl. 179-100.2md.

Morris, Arnold D.: *See—*
Frederickson, Arthur R.; Morris, Arnold D.; and Jackson, B. Walter, 3,749,963.

Morris, Eugene B., Jr.: *See—*
Hull, Gerry G.; and Morris, Eugene B., Jr., 3,748,821.

Morris, Harold B., to Seismic Logs, Inc. Pressure transducer. 3,749,948, Cl. 310-9.400.

Morris, Milan Samuel. Basketball and football washing head. 3,748,681, Cl. 15-183.000.

Morris, Philip, Incorporated: *See—*
Johnson, William R., Jr.; and Davis, Leonard M., Jr., 3,749,685.

Morrison, Howard J.: *See—*
Glass, Marvin I.; Morrison, Howard J.; Nix, Donald F.; and Allen, Robert N., 3,748,780.

Morse, Milton. Chain shifting means for derailleur speed changing devices. 3,748,916, Cl. 74-217.00b.

Morton, Harold, to Oldham International Limited. Secondary batteries. 3,749,609, Cl. 136-170.000.

Morton-Norwich Products, Inc., mesne: *See—*
Andelfinger, George F.; and Kuhajek, Eugene J., 3,749,579.

Moses, Adrian John, to Lear Siegler, Inc. Voltage to frequency converter for long term digital integration. 3,749,942, Cl. 307-271.000.

Mosier, Richard C., to General Electric Company. Method of removing high-temperature enamel insulation from electrically conductive wire. 3,749,602, Cl. 134-19.000.

Mosterd, Jacob H. Device for succesively discharging objects from holders. 3,749,260, Cl. 214-60.000.

Motegi, Norio: *See—*
Kodaira, Nobuhisa; and Motegi, Norio, 3,748,842.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Vedova, Ralph, 3,748,854.

Motorola, Inc.: *See—*
Andrews, James E., 3,750,032.
Barnes, James A.; and Kesner, Donald R., 3,750,142.
Derdzinski, Terrence E.; Finger, Carl; and Geradi, Frank R., 3,749,982.
Gay, Michael J., 3,750,041.
Schafft, Hugo W., 3,749,855.

Mott, Richard C.; and Wentworth, Milo R., to Honeywell Inc. Day cycle restoration mechanism. 3,749,306, Cl. 236-47.000.

Mountford, Allan Reginald: *See—*
Lowen, Michael David; and Mountford, Allan Reginald, 3,750,063.

Movchan, Boris Alexeevich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasielevich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Moxey, Harold J., 20% to Lee, Raymond, Organization, Inc., The and 21% to Moffett, Ray H. Air charger packer. 3,749,164, Cl. 166-68.000.

Moyer, William H.: *See—*
Jaeschke, Ralph L.; Moyer, William H.; and Wiltsey, Howard E., 3,749,216.

Mozhaev, Arkady Ivanovich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Mrozek, James M., to Brady, W. H., Co. Disc for label-making machine and method of manufacture. 3,748,977, Cl. 95-85.000.

Mudder, Hinderk: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.

Mueller, Walter F. Fish and bait trap. 3,748,776, Cl. 43-103.000.

Muller, Adam: *See—*
Hadam, Wilhelm; and Muller, Adam, 3,748,872.

Muller, Arnold. Variable-speed asynchronous motor with multiple rotors. 3,749,949, Cl. 310-59.000.

Mulst, George D., to International Telephone and Telegraph Corporation. Radio location detection system. 3,750,178, Cl. 343-112.00r.

Munchbach, Curt, to Ungerer, Irma. Flying shears for cutting rapidly running sheet metal bands. 3,748,938, Cl. 83-305.000.

Mundy, Joseph L., to General Electric Company. Read mostly associative memory cell for universal logic. 3,750,115, Cl. 340-173.0am.

Munro, Donald Gilbert: *See—*
Wreghitt, Kenneth W.; Pusfy, Peter Shirley; and Munro, Donald Gilbert, 3,749,273.

Munt, Irwin, to Weston Instruments, Inc. Leading zero suppression display system. 3,749,896, Cl. 235-152.000.

Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing a semiconductor integrated circuit isolated by dielectric material. 3,749,619, Cl. 156-17.000.

Muri, George, to DBM Industries, Limited. Portable punch. 3,748,940, Cl. 83-414.000.

Murphy, G. W., Industries, Inc.: *See—*
Schumacher, Percy W., Jr., 3,749,188.

Murtha, James E.: *See—*
Downes, George R., Jr.; Brewer, Stanley F.; and Murtha, James E., 3,750,005.

Music, William A., to Schwien Engineering, Inc. Pressure standard. 3,748,891, Cl. 73-4.00d.

Musson, William F. J. Boldable boat. 3,748,670, Cl. 9-2.00c.

Mutter, William W.; and Grunner, George P., to Bulova Watch Company, Inc. Electronic system module for crystal-controlled watch. 3,748,845, Cl. 58-23.00a.

Muzhzhavlev, Konstantin Dmitrievich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Myers, John L., to Ledex Inc. External stop for rotary solenoid. 3,750,065, Cl. 335-272.000.

Nagao, Taichiro: *See—*
Baba, Takeshi; Shibuya, Kenji; Sasada, Masaaki; Nakagawa, Mikio; and Nagao, Taichiro, 3,750,020.

Nagaoka, Yoshitomi: *See—*
Sagishima, Takayuki; Sasaki, Reiichi; and Nagaoka, Yoshitomi, 3,749,824.

Nagasima, Takeomi, to Asahi Glass Company, Ltd. Defogging glass plate. 3,749,885, Cl. 219-522.000.

Nagy, John R.: *See—*
Rothfusz, Ralph W.; and Nagy, John R., 3,749,065.

Nahm, Lee Jerome, Jr., to Ralston Purina Company. Centering method. 3,749,586, Cl. 99-113.000.

Nakagawa, Jihei; and Nakamura, Sumio, to Olympus Optical Company Limited. Lens system having a large aperture and long focal length. 3,749,478, Cl. 350-216.000.

Nakagawa, Mikio: *See—*
Baba, Takeshi; Shibuya, Kenji; Sasada, Masaaki; Nakagawa, Mikio; and Nagao, Taichiro, 3,750,020.

Nakamichi, Niro, to Nakamichi Research, Incorporated. Tape-pad for magnetic recording and reproducing apparatus. 3,749,851, Cl. 179-100.20r.

Nakamichi Research, Incorporated: *See—*
Nakamichi, Niro, 3,749,851.

Nakamura, Sumio: *See—*
Nakagawa, Jihei; and Nakamura, Sumio, 3,749,478.

Nakamura, Toshio: *See—*
Matuzaki, Tetuo; Nakamura, Toshio; and Egawa, Hitoshi, 3,749,459.

Nakane, Kazushige; Honmi, Tadashi; and Koike, Katsumi, to Aisin Seiki Kabushiki Kaisha. Carriage mechanism of a hand knitting apparatus. 3,748,873, Cl. 66-78.000.

Nakazawa, Yoshiyuki: *See—*
Sato, Akira; Ikeda, Tadashi; Nakazawa, Yoshiyuki; and Takei, Haruo, 3,749,714.

Nakinsky, Isaak Emmanuilovich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

Nangarrow, John; Jones, Paul Victor; and Clark, Peter Stanley, to Foseco Trading A.G. Hot topping and an ingot mould by adhesively bonding slabs to the mould wall. 3,749,628, Cl. 156-309.000.

Napadow, Stanley C., to ILG Industries, Inc. Method and apparatus for protecting chain conveyor. 3,749,229, Cl. 198-177.00r.

Narayanan, Venkatachala L.: *See—*
Haugwitz, Rudiger D.; Maurer, Barbara V.; and Narayanan, Venkatachala L., 3,749,717.

Narco Scientific Industries, Inc.: *See—*
Smith, John F., 3,750,057.

Natens, Luc Yves: *See—*
Staes, Karel Germanus; and Natens, Luc Yves, 3,748,981.

Nathan, Emanuel, to Opticase, Inc. Spectacle case. 3,749,231, Cl. 206-5.00r.

National Cash Register Company, The: *See—*
Bruckner, Ronald L.; and Helmbold, James E., 3,750,000.
Gartmell, James V., 3,749,474.

National Poultry Equipment Co.; division of Dawson & Co., Inc.: *See—*
Denherder, Gerald, 3,749,227.

National Research Development Corporation: *See—*
Carr-Brion, Kenneth Garfield; and Bramwell, Susan Elizabeth, 3,749,910.
Pirt, Stanley J., 3,749,646.
Stephenson, Stephen David; and Richards, John Rees Morgan, 3,749,567.
Sullivan, Arthur Basil Joseph; and Houldcroft, Peter Thomas, 3,749,878.

National Water Main Cleaning Co.: *See—*
Primus, Norman S.; and Hunhoff, Raymond, 3,749,056.

National-Southwire Aluminum Company: *See—*
Cook, Henry S.; and Schwartz, Robert E., 3,749,388.

Natter, Howard. Burglary deterrent system. 3,750,132, Cl. 340-309.100.

Naylor, Hugh E., III, to International Business Machines Corporation. Synchronization of multiple ink jets. 3,750,191, Cl. 346-75.000.

Near, Charles W.: *See—*
Kohoutek, Jindrich; and Near, Charles W., 3,749,899.

Nedreski, Robert Joseph, to General Electric Company. Static field current control apparatus for reel drives. 3,749,329, Cl. 242-75.510.

Nedreski, Robert Joseph, to General Electric Company. Tension reference signal generation means for reel drives. 3,749,331, Cl. 242-75.510.

Neiman, Richard Alvin; and Schwalm, Glendon Henry, to AMP Incorporated. Method and apparatus for removing insulation from wires intermediate the ends thereof. 3,748,932, Cl. 81-451.000.

Nelboeck-Hochstetter, Michael; and Beaucamp, Klaus, to Boehringer Mannheim Gesellschaft mit beschrankter Haftung. Process for the purification of reduced pyridine coenzymes. 3,749,709, Cl. 260-211.50r.

Nelson, Carl S., Jr., to Mattel, Inc. Low distortion optical organ. 3,749,808, Cl. 84-1.180.

Nelson, Howard W., to Veeder Industries, Inc. ull dispesing system with indicator verification means. 3,749,283, Cl. 222-27.000.

Nelson, Richard Kent, to Bell Telephone Laboratories, Incorporated. Control circuit for linear control of bode network. 3,750,007, Cl. 323-19.000.

Nettco Corporation: *See—*
Lennon, John J., 3,749,411.

Neunhoeffer, Otto: *See—*
Lehmann, Gunter; Neunhoeffer, Otto; Roselius, Wilhelm; and Vitzthum, Otto, 3,749,698.

New Nippon Electric Company, Ltd.: *See—*
Yamamoto, Yasuhiko; Shimada, Sugao; and Matsuno, Suguru, 3,749,468.

Newcomer, John I., to Amerock Corporation. Knock down cabinet and hardware for assembling the same. 3,749,465, Cl. 312-245.000.

Newman, James W., to Windings Inc. Method of producing a package of flexible material with radial inner end feed out. 3,748,817, Cl. 53-21.0fw.

Newmark, Harold Leon: *See—*
Cort, Winifred; and Newmark, Harold Leon, 3,749,799.

Ney, J. M., Company, The: *See—*
Pilkington, Russell T., Sr.; and Pilkington, Russell T., Jr., 3,749,882.

Nicholson, Michael, to Sattley Company. Rolled coin packer. 3,749,998, Cl. 53-59.00r.

Nicholson, Robert D.: *See—*
Sallberg, David W.; Clark, Peter I.; Parker, Wesley R.; and Nicholson, Robert D., 3,749,128.

Nicol, Charles H.: *See—*
Jones, John Paul; and Nicol, Charles H., 3,749,673.
Jones, John Paul; and Nicol, Charles H., 3,749,674.

Nicolas, Michel; and Alison, Jacques, to Compagnie Industrielle Francaise des Tubes Electroniques. Method for making dry reed switches. 3,749,562, Cl. 65-34.000.

Nicolson, John G. Wheeled ski. 3,749,413, Cl. 280-11.200.

Niedecker, Herbert. Sausage filling apparatus. 3,748,690, Cl. 17-33.000.

Niedzwiecki, Richard W.: *See—*
Jones, Robert E.; and Niedzwiecki, Richard W., 3,748,853.

Nihon Denshi Kabushiki Kaisha: *See—*
Hirata, Yoshihiro, 3,749,964.
Miyauchi, Sakae; Tanaka, Kazumitsu; Takayanagi, Shinji; and Kawakami, Kenji, 3,749,821.

Niinomi, Naoyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Circuit arrangement capable of continuously varying tone colors for electrical musical instruments. 3,749,809, Cl. 84-1.240.

Nikitin, Jury Ivanovich: *See—*
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

Nikolaev, Mikhail Mikhailovich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Ninger, Fred C.; and Eichman, Martin L., to Warner-Lambert Company. Gelled steroid ointment. 3,749,773, Cl. 424-81.000.

Nippon Electric Company, Limited: *See—*

Ohkubo, Toshio; Ayaki, Kazuo; and Terazawa, Yoshizumi, 3,750,190.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Niinomi, Naoyuki, 3,749,809.
Nippon Kogaku K.K.: *See*—
Kimura, Shuji; and Daitoku, Koichi, 3,748,986.
Nippon Kokan Kabushiki Kaisha: *See*—
Matsuzaki, Akio; Tsuruoka, Kanzi; Sada, Tetuo; and Onishi, Hiroshi, 3,749,241.
Ogawa, Kiichi; Shoji, Setsuo; and Sukegawa, Tomoyoshi, 3,748,385.
Nippon Koki Co., Ltd., mesne: *See*—
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.
Nippon Steel Corporation: *See*—
Kushima, Kosei; and Yahano, Kanji, 3,749,598.
Nippon Telegraph and Telephone Public Corporation: *See*—
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kainoka, Toshimitsu, 3,749,220.
Watanabe, Kazuhisa, 3,750,026.
Nippondenso Kabushiki Kaisha: *See*—
Oishi, Kazuo; Kurebayashi, Tokuhiro; and Ando, Noriyoshi, 3,749,070.
Nischk, Gunther: *See*—
Engelhard, Helmut; Bentz, Francis; Brokmeier, Dieter; and Nischk, Gunther, 3,749,701.
Nishiba, Seishiro, to Denki Onkyo Co., Ltd. Contactless switching apparatus. 3,750,077, Cl. 338-32.00r.
Nishikawa, Masao; and Akima, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Backpressure generating apparatus in an oil pressure operated circuit. 3,749,112, Cl. 137-106.000.
Nishimura, Susumu: *See*—
Yoshimura, Hirofumi; Takahata, Hisatoshi; Furuhata, Akio; and Nishimura, Susumu, 3,748,978.
Nissan Motor Company, Limited: *See*—
Mohri, Yohichi; and Ishizaki, Masayuki, 3,748,926.
Usui, Keizaburo; Mitsuashi, Ken Ichi; and Yamaguchi, Michio, 3,749,419.
Nisshin Oil Mills, Ltd., The: *See*—
Sakita, Takashi; Ebisawa, Masaaki; and Mimoto, Hiroshi, 3,749,581.
Nix, Donald F.: *See*—
Glass, Marvin I.; Morrison, Howard J.; Nix, Donald F.; and Allen, Robert N., 3,748,780.
Nolan, Barry Allaire: *See*—
Van Der Veer, Frank Willard; and Nolan, Barry Allaire, 3,749,822.
Nolles, Anthony. Animated display device. 3,748,769, Cl. 40-106.520.
Noni Corporation: *See*—
Cross, John F., 3,749,077.
Nooter Corporation: *See*—
Hibbeler, Charles L., 3,749,161.
Norba Aktiebolag: *See*—
Lindeborg, David Georg; and Dahlin, Ake Bertil Ingemar, 3,749,267.
Nordeen, Carl William: *See*—
Stein, Robert George; and Nordeen, Carl William, 3,749,715.
Norman, George, & Co., Pty., Ltd.: *See*—
Bini, Rodney James, 3,749,441.
Northern Illinois Gas Company: *See*—
Martell, Dennis J., 3,750,156.
Northrop, Donald P.: *See*—
Emidy, Thomas J.; Northrop, Donald P.; Thorington, Luke; and Olsen, Andrew Henry, 3,749,467.
Norton Company: *See*—
Eisner, Steve, 3,749,652.
Nowlin, Radford L. Counter current pomace washer. 3,749,002, Cl. 99-536.000.
Nuding, James M.: *See*—
Wong, Alfred Y.; Nuding, James M.; and Lucky, Zalton J., 3,750,137.
Nutrico, Inc., mesne: *See*—
Krueger, Robert K.; Bayne, Peter D.; and Weston, Steven S., 3,749,795.
Oakes, Lloyd, to Joy Manufacturing Company. Elastomeric cover for a pendant switch with an untensioned intermediate position. 3,749,870, Cl. 200-168.00g.
Oakley, Ernest C.: *See*—
United States of America, National Aeronautics and Space Administration, 3,750,016.
O'Brien, D. G., Inc.: *See*—
Berian, Albert G., 3,750,088.
Obukhov, Vitaly Arsenievich; and Glazkov, Vladimir Petrovich. Rotor of a synchronous non-salient-pole machine. 3,749,957, Cl. 310-265.000.
Ocker, Herbert: *See*—
Hermann, Heinz; and Ocker, Herbert, 3,749,375.
O'Connor, Joseph W.; and Orem, Victor C., to United States of America, National Aeronautics and Space Administration. Fastener stretcher. 3,749,362, Cl. 254-29.00a.
Odashima, Takeshi; and Makita, takeo, to Kabushiki Kaisha Saginomiya Seisakusho. Bifunctional thermostat device for a heating type refrigerator having both an electric heater and a gas heater. 3,749,307, Cl. 236-48.000.
Oesterling, Thomas O.: *See*—
Stehle, Randall G.; and Oesterling, Thomas O., 3,749,800.
Oetzel, Leslie R. Coin collecting game apparatus. 3,749,404, Cl. 273-135.00b.
Ogawa, Kazuyuki: *See*—
Miyashiro, Shoichi; Ogawa, Kazuyuki; and Hori, Hiroo, 3,749,969.
Ogawa, Kiichi; Shoji, Setsuo; and Sukegawa, Tomoyoshi, to Nippon Kokan Kabushiki Kaisha. Cutter for wide flat bars. 3,748,385, Cl. 266-23.00b.
Ogawa, Kinya: *See*—
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,749,710.
O'Gieblyn, Erjest J.: *See*—
Burden, Roy B., Jr.; and O'Gieblyn, Erjest J., 3,749,030.
Ohashi, Taizo: *See*—
Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, 3,749,619.
Ohio State University, The: *See*—
Velkoff, Henry R., 3,749,545.
Ohkubo, Kinji; and Kato, Kazunobu, to Fuji Photo Film Co., Ltd. Image-receiving material for use in silver salt diffusion transfer photography. 3,749,578, Cl. 96-119.000.
Ohkubo, Toshio; Ayaki, Kazuo; and Terazawa, Yoshizumi, to Nippon Electric Company, Limited. Electrostatic recording device utilizing the electric potential in a discharge space. 3,750,190, Cl. 346-74.0es.
Ohta, Shoji: *See*—
Moriya, Shozo; Ohta, Shoji; Iwawaki, Yasutaka; and Usui, Yukio, 3,749,852.
Oil Mop, Inc.: *See*—
Rhodes, Herbert M., 3,748,682.
Oishi, Kazuo; Kurebayashi, Tokuhiro; and Ando, Noriyoshi, to Nippondenso Kabushiki Kaisha. Control system for internal combustion engines. 3,749,070, Cl. 123-117.00r.
Oivatonna Manufacturing Co., Inc.: *See*—
Kanengieter, Glenn G.; and Barry, Gerald P., 3,748,840.
Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Self-retracting type seat belt device for vehicle use. 3,750,102, Cl. 340-52.00e.
Okano, Kohei, to Kabushiki Kaisha Tamura Seisakusho. Coil bobbin. 3,750,073, Cl. 336-198.000.
Okuno Chemical Industry Company Limited: *See*—
Yoshimura, Chozo, 3,749,596.
Oldford, William G., to Huron Tool and Mfg. Co. Screen fitting. 3,749,250, Cl. 210-448.000.
Oldham International Limited: *See*—
Morton, Harold, 3,749,609.
Olesen, Ole V. Foreign object locator. 3,750,095, Cl. 340-3.00c.
Olin Corporation: *See*—
Dore, James E.; and Mc Nutt, Charles R., 3,749,152.
Oliver Tire & Rubber Company: *See*—
Burger, Edwin M., 3,749,131.
Olivetti, Ing., C., & C., S.p.A.: *See*—
Pomella, Piero; and Lauro, Luciano, 3,749,996.
Olsen, Andrew Henry: *See*—
Emidy, Thomas J.; Northrop, Donald P.; Thorington, Luke; and Olsen, Andrew Henry, 3,749,467.
Olympus Optical Co., Ltd.: *See*—
Kamachi, Shin-Ichi, 3,749,890.
Olympus Optical Company Limited: *See*—
Nakagawa, Jihei; and Nakamura, Sumio, 3,749,478.
Oman, Gary F., to Johnson Service Company. Temperature monitoring circuit. 3,750,155, Cl. 340-183.000.
Omark Industries, Inc.: *See*—
Ross, Cecil John, Jr., 3,748,942.
Omega Louis Brandt & Frere S.A.: *See*—
Sauthier, Pierre, 3,749,986.
Onda, Yoshiro: *See*—
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,749,710.
Onishi, Hiroshi: *See*—
Matsuzaki, Akio; Tsuruoka, Kanzi; Sada, Tetuo; and Onishi, Hiroshi, 3,749,241.
Ono, Mitsuzo: *See*—
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.
Optical Recognition Systems, Inc.: *See*—
Holdway, John B.; and Tyburski, Robert M., 3,749,239.
Opticase, Inc.: *See*—
Nathan, Emanuel, 3,749,231.
Orain, Michel, to Societe Anonyme: Glaenzer Spicer. Transmission coupling with spherical roller. 3,748,869, Cl. 64-17.00a.
Orban, Jean: *See*—
Vital, Zoltan; and Orban, Jean, 3,749,921.
Orem, Victor C.: *See*—
O'Connor, Joseph W.; and Orem, Victor C., 3,749,362.
Orient Watch Co., Ltd.: *See*—
Takagi, Tooru, 3,748,849.

Ormsbee, Mary K.; Saadeh, Mouin I.; and Skulby, Leonard, to Dick, A. B., Company. Electrostatic liquid developer containing dye coated carbon particles. 3,749,670, Cl. 252-62.100.

Orndorff, Roy L., Jr., to Goodrich, B. F., Company, The. Mud resistant elastomers. 3,748,951, Cl. 36-7.300.

Osborne, Thomas Lawrence, to Bell Telephone Laboratories, Incorporated. Charge parceling integrator. 3,750,143, Cl. 340-347.0ad.

Osifchin, Nicholas: *See—*
Bankert, Jon Calvin, Jr.; Lutchansky, Milton; Osifchin, Nicholas; and Willis, Clarence Jesse, 3,750,058.

Osofsky, Irving B., to McDonnell Douglas Corporation. Thrust vector control system. 3,749,317, Cl. 239-265.190.

Oster, John, Manufacturing Co.: *See—*
Artin, Robert Lee; and Petroske, Robert Paul, 3,749,951.

Ostoich, Eli: *See—*
Slingluff, Eugene L.; and Ostoich, Eli, 3,749,134.

Oswald, Donald R.: *See—*
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., 3,748,677.

Oswald, Richard J.: *See—*
Smith, James E.; and Oswald, Richard J., 3,748,683.

Ouellet, Paul. Building structure with composite arched units and method of construction thereof. 3,748,796, Cl. 52-86.000.

Ovard, John C.: *See—*
Furlong, Donn B.; and Ovard, John C., 3,748,832.

Ow, Gordon Y. W., to Go-Craft Systems, Inc. Removable transom construction. 3,749,046, Cl. 115-17.000.

Owens Illinois, Inc.: *See—*
Schmersal, Larry J.; and Wojcik, Gerald E., 3,749,959.

Owens-Corning Fiberglas Corporation: *See—*
Benson, Gustav E., 3,749,055.
Marzocchi, Alfred, 3,749,757.
Renaud, Laurent C.; and Charon, Clarence W., 3,749,638.

Owens-Illinois, Inc.: *See—*
Bayer, John W., 3,749,630.
Grier, John D.; and Camp, Harold E., 3,749,487.
Heider, James Elmer; and Schult, Thomas H., 3,748,868.
Hider, Shibley A.; Kitaj, Walter; and Martin, Robert E., 3,749,591.
Petty, William D., 3,749,971.
Schmersal, Larry J., 3,749,970.
Wojcik, David S., 3,750,159.
Zitkus, Wayne J., 3,750,050.

Pachulia, Budu Pavlovich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Package Machinery Company: *See—*
Weisend, Burke A., 3,750,134.

Packaging Industries, Inc.: *See—*
Brown, Fred P., Jr., 3,749,544.

Pacofsky, Edward Anthony, to Du Pont de Nemours, E. I., and Company. Polyester yarn. 3,748,844, Cl. 57-140.00r.

Pagdin, William G.; and Constable, Charles F., to Schlitz, Jos., Brewing Company. Apparatus for crushing and/or compacting. 3,749,004, Cl. 100-50.000.

Pai, Panemangalore S., to BASF Wyandotte Corporation. Reducing free formaldehyde content in methylolated carbamates. 3,749,751, Cl. 260-482.00c.

Paige, Janet N.: *See—*
Tomalia, Donald A.; and Paige, Janet N., 3,749,683.

Pakulak, Jack M., Jr., to United States of America, Navy. Outgassing technique. 3,749,024, Cl. 101-101.000.

Palmer, George W.: *See—*
Herpich, William A.; Park, Glenn S.; and Palmer, George W., 3,749,261.

Palmer, Robert E. Theft-proof lock-means for securing a motorcycle to the 2ehicle carrying deck of a motor coach. 3,749,295, Cl. 224-29.00r.

Pancy, Richard E., to General Motors Corporation. Vehicle occupant restraining belt arrangement. 3,749,418, Cl. 280-150.0sb.

Panzer, Norman. Drinking straw for double contrast radiography. 3,749,312, Cl. 239-33.000.

Panzica, Nicholas J., to Peabody Engineering Corporation. Liquid filter for gas washing apparatus. 3,748,835, Cl. 55-228.000.

Park, Glenn S.: *See—*
Herpich, William A.; Park, Glenn S.; and Palmer, George W., 3,749,261.

Parker, Alvin S. Plasterboard to column clip. 3,748,815, Cl. 52-714.000.

Parker, Wesley R.: *See—*
Sallberg, David W.; Clark, Peter I.; Parker, Wesley R.; and Nicholson, Robert D., 3,749,128.

Parrent, George B., Jr., to Technical Operations, Incorporated. Optical imaging. 3,749,489, Cl. 355-52.000.

Parsons, Ronald, to Singer Company (U.K.) Limited, The, mesne. Tufting machines. 3,748,914, Cl. 74-42.000.

Pasquiou, Jean-Yves: *See—*
Clech, Albert; Marchand, Georges; and Pasquiou, Jean-Yves, 3,749,370.

Passalenti, Beppino: *See—*
Vargiu, Silvio; Passalenti, Beppino; and Abruzzi, Pierluigi, 3,749,689.

Patel, Nagar J.; and Siviy, George, to Westinghouse Electric Corporation. Circuit interrupting apparatus. 3,750,059, Cl. 335-142.000.

Patella, Ralph F., to Celanese Corporation. Aqueous interpolymer emulsions and use thereof in latex paints. 3,749,690, Cl. 260-29.6ta.

Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich. Method and an electron-beam furnace for ingot production. 3,749,149, Cl. 164-50.000.

Patrick, Archibald S.; and Johnson, Robert G. Inner tube-type recreation vehicle. 3,748,672, Cl. 9-347.000.

Patton, Eugene K.: *See—*
Miller, Kenneth J.; and Patton, Eugene K., 3,748,889.

Paul, Herman L., Jr. Venturi-ball valve No. 103. 3,749,355, Cl. 251-124.000.

Pauliukonis, Richard S. Membrane shutoff valve. 3,749,353, Cl. 251-61.100.

Pawlak, Joseph A.; and Bean, Claude Thomas, Jr., to Hooker Chemical Corporation. Oil modified polyurethane coatings. 3,749,686, Cl. 260-19.00a.

Payen, Jean-Pol, to Merlin Gerin, Societe Anonyme. Device for current collecting with separate brushes. 3,749,858, Cl. 191-45.00r.

Peabody Engineering Corporation: *See—*
Panzica, Nicholas J., 3,748,835.

Peabody Galion Corporation: *See—*
Herpich, William A.; Park, Glenn S.; and Palmer, George W., 3,749,261.

Peckar, George E. Magnetically sealable container. 3,749,301, Cl. 229-44.00r.

Pedersen, Hans Kristian: *See—*
Petersen, Poul; and Pedersen, Hans Kristian, 3,750,082.

Pedima Corporation: *See—*
Petersen, Harold E.; and Matthews, Richard A., 3,750,003.

Peham, Engelbert J., to Peham Plastics, Inc. Miniature hats. 3,748,660, Cl. 2-175.000.

Peham Plastics, Inc.: *See—*
Peham, Engelbert J., 3,748,660.

Peil, William; and McFadyen, Robert J., to General Electric Company. Amplifier of controllable gain. 3,750,042, Cl. 330-29.000.

Pelorex Corporation: *See—*
Rait, Joseph M.; Gilmour, Alexander Scott, Jr.; Sellers, Edward C.; and Lindberg, Edward, 3,749,833.

Peltier, Henri: *See—*
Fauquembergue, Jean G.; Lingrand, Michel; Peltier, Henri; and Chatourel, Pierre, 3,749,153.

Peltner, Johannes: *See—*
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, 3,749,209.

Penn Aircraft Products, Incorporated: *See—*
Wolcott, Glenn R., 3,748,886.

Pennsylvania Engineering Corporation: *See—*
Dortenzu, Alexander I.; and Sczerba, Stanley T., 3,749,116.

Pennwalt Corporation: *See—*
Schubert, Thomas J., 3,749,390.

Penton, Jack I.: *See—*
Swann, Richard C. G.; and Penton, Jack I., 3,749,610.

Perepelitsa, Igor Vasieievich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Perilstein, Warren L., to Ethyl Corporation. Gasoline compositions. 3,749,560, Cl. 44-80.000.

Perkins Engines Limited: *See—*
Stewart, William F., 3,748,925.

Peroy, Francois: *See—*
Rouvre, Philippe; and Peroy, Francois, 3,750,080.

Perrin, David P.: *See—*
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., 3,748,957.

Perrine, Nathan L. Mounting apparatus for m2il boxes and the like. 3,749,342, Cl. 248-123.000.

Perrine, Walter E. Adjustable hesitation blow-back operated gun toggle mechanism. 3,748,961, Cl. 89-189.000.

Perry, Ernest J.: *See—*
Hollister, Kenneth R.; and Perry, Ernest J., 3,749,577.

Persson, Eric Sigfrid; and Persson-Melin, Signe Harriet, to Expo Nord AB. Sitting furniture. 3,749,444, Cl. 297-445.000.

Persson-Melin, Signe Harriet: *See—*
Persson, Eric Sigfrid; and Persson-Melin, Signe Harriet, 3,749,444.

Peruglia, Marco; and Anselmino, Giovanni, to Fiat Societa per Azioni. Solenoid-actuated pneumatic actuator for anti-skid vehicle braking systems. 3,749,125, Cl. 137-596.160.

Peter, Joseph E.: *See—*
Sumner, Paul E.; and Peter, Joseph E., 3,749,051.

Peterfalvi, Michel: *See—*
Allais, Andre; and Peterfalvi, Michel, 3,749,723.

Peters, Randall W., to ESB Incorporated. Battery having zinc electrode containing TiO_2. 3,749,605, Cl. 136-30.000.

Petersen, Harold E.; and Matthews, Richard A., to Pedima Corporation. Switching circuit for inverters and the like. 3,750,003, Cl. 321-12.000.

Petersen, Poul; and Pedersen, Hans Kristian, to Danfoss A/S. Plug assembly with resistor. 3,750,082, Cl. 338-320.000.

Peterson, Carl R., to United States of America, Navy. Parachute retarding tail assembly for bomb. 3,749,017, Cl. 102-4.000.

Peterson, John A.: *See—*
Dorsey, Edward G., Jr.; Peterson, John A.; and Lund, Robert K., 3,749,615.

Petrak, Heinz: *See—*
Latussek, Hans Peter; and Petrak, Heinz, 3,749,457.

Petroske, Robert Paul: *See—*
Artin, Robert Lee; and Petroske, Robert Paul, 3,749,951.

Petty, William D., to Owens-Illinois, Inc. Line isolation and address multiplexing system for gas discharge display matrix. 3,749,971, Cl. 315-169.0tv.

Petzetakis, Aristovoulos G. Braiding machine. 3,748,952, Cl. 87-29.000.

Pews, Richard Garth: *See—*
Bergman, Sylvester; and Pews, Richard Garth, 3,749,600.

Pezaris, Constantine D.; and Trame, Paul J., to Thermo Electron Corporation. Vapor engine speed control. 3,748,966, Cl. 91-364.000.

Pfeiffer, Kurt: *See—*
Beckmann, Gunter; Dietrich, Johannes; and Pfeiffer, Kurt, 3,749,555.

Pfeiler, Manfred: *See—*
Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, 3,749,868.

Pfenning, Hans, to Bach & Co. Electromagnetic relay. 3,750,060, Cl. 335-135.000.

Pfouts, Robert R.: *See—*
Fernandes, Joseph F.; Pfouts, Robert R.; and Lord, Thomas J., 3,749,308.

Philco-Ford Corporation: *See—*
Schweitzer, Robert W.; and Drury, Harvey J., 3,748,708.

Philippaerts, Herman Adelbert: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,749,574.

Phillips Petroleum Company: *See—*
Hessert, James E.; and Clampitt, Richard L., 3,749,172.
Keiser, Le Roy H., 3,749,593.
Kinney, Alfred W., 3,749,277.
Marx, John W., 3,749,171.
Rohde, Raymond, 3,749,247.
Skraba, Frank W., 3,749,753.

Photovolt Corporation: *See—*
Dahms, Harald; Levy, Gabor B.; and Seltzer, David A., 3,749,659.

Physics International Company: *See—*
Godfrey, Charles S., 3,748,953.

Pierre, Marcel J., to Materiel Applications Plastiques. Apparatus for automatically placing phonographic record labels inside the mound of a parellel-platen press. 3,749,396, Cl. 271-5.000.

Pilkington, Russell T., Jr.: *See—*
Pilkington, Russell T., Sr.; and Pilkington, Russell T., Jr., 3,749,882.

Pilkington, Russell T., Sr.; and Pilkington, Russell T., Jr., to Ney, J. M., Company, The. Muffle construction. 3,749,882, Cl. 219-390.000.

Piller, Bernhard, to Ciba-Geigy AG. Photographic light-sensitive silver halide material containing azo dyes. 3,749,576, Cl. 96-99.000.

Pilot Research Corporation: *See—*
Fregeolle, Oscar, 3,748,870.

Pilpel, Walter: *See—*
Alver, Alf S.; and Pilpel, Walter, 3,749,518.

Pinto, Franca, to Pinto, Mario, S.p.A. Rotary fluid cylinder for self-centering chuck. 3,748,968, Cl. 91-420.000.

Pinto, Mario, S.p.A.: *See—*
Pinto, Franca, 3,748,968.

Pinto, Patrick J.: *See—*
Wolfelsperger, Robert O.; and Pinto, Patrick J., 3,749,393.

Pirovano, Camillo. Apparatus for the automatic distribution of feed. 3,749,062, Cl. 119-51.0cf.

Pirt, Stanley J., to National Research Development Corporation. Method and apparatus for continuous addition of a component to a reaction system. 3,749,646, Cl. 195-117.000.

Piscetta, Armando. Safety device for obsolete firearms. 3,748,771, Cl. 42-66.000.

Pitbladdo, Richard B.: *See—*
Howitt, John S.; and Pitbladdo, Richard B., 3,749,130.

Pitroda, Satyan G.: *See—*
Kobylar, Alex W.; Lindsay, Robert L.; and Pitroda, Satyan G., 3,750,111.

Pittner, John R., to Westinghouse Electric Corporation. Tension control including motor speed regulation system. 3,749,989, Cl. 318-6.000.

Pittner, John Richard, to Westinghouse Electric Corporation. Constant tension control system for a DC reel drive motor. 3,749,988, Cl. 318-6.000.

Piziks, Henry I.: *See—*
Farrell, Robert C.; Skelley, John W.; Milton, Thomas J.; and Piziks, Henry I., 3,748,921.

Pizzarello, Frank A.; and Medellin, Daniel. Lapping machine and vibratory drive system therefor. 3,748,790, Cl. 51-58.000.

Placente, Luigi; and Gandolfi, Giovanni, to Societa Italiana Telecomunicazioni Siemens S.p.A. Device for blocking toll calls from subscriber telephones. 3,749,847, Cl. 179-90.00d.

Plaisance, Anatale J.: *See—*
Addison, Frank E., 3,749,126.

Pless, Janos: *See—*
Guttmann, Stephan; Sandrin, Edmond; Pless, Janos; and Willems, Hans, 3,749,703.

Plessey Incorporated: *See—*
LeDonne, Daniel A., 3,750,053.

Plume, A. W., Limited: *See—*
Plume, Alan Walter, 3,749,154.

Plume, Alan Walter, to Plume, A. W., Limited. Low-pressure die-casting apparatus and device for pre-production setup of same. 3,749,154, Cl. 164-306.000.

Podo, Russell B.: *See—*
Fedor, Richard M.; and Podo, Russell B., 3,749,399.

Poget, Rene, to Fabrique de Machines Andre Bechler S.A. Elastic coupling. 3,748,866, Cl. 64-15.00b.

Pogonowski, Ivo C.; Carmichael, Paul D.; and Bodor, Edward E., to Texaco Inc. Connection for a nonmetallic foundation pile. 3,748,863, Cl. 61-53.000.

Polak, James C.: *See—*
Cross, Norman A.; and Polak, James C., 3,748,924.

Polaroid Corporation: *See—*
Bjork, Albion P.; and Conner, James M., 3,748,987.
Brandt, Edison R.; Cronin, David V.; and Skurski, James K., 3,748,980.
Brandt, Edison R., 3,748,985.
Downey, Rogers B., 3,748,988.
Gold, Nicholas, 3,748,983.
Gold, Nicholas, 3,748,984.
Stella, Joseph A., 3,748,994.
Timson, William J., 3,749,053.

Pollet, Robert Joseph; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, to Agfa-Gevaert N.V. Development of photographic silver halide elements. 3,749,574, Cl. 96-66.300.

Pollitzer, Ernest L.; and Mitsche, Roy T., to Universal Oil Products Company. Olefin hydroisomerization process. 3,749,752, Cl. 260-683.700.

Poly-Optics, Inc.: *See—*
Clough, Douglas W., 3,749,901.

Pomella, Piero; and Lauro, Luciano, to Olivetti, Ing., C., & C., S.p.A. Numerical control device for machine tools with provision for speed adjustment during motion. 3,749,996, Cl. 318-571.000.

Ponder & Best, Inc., mesne: *See—*
Vital, Zoltan; and Orban, Jean, 3,749,921.

Ponthus, Louis: *See—*
Jamet, Jean; and Ponthus, Louis, 3,749,928.

Popescu, Mihail: *See—*
Constantinescu, Petre; Popescu, Mihail; and Dumitrescu, Constantin, 3,748,801.

Poretti, Isidoro, to Societa Italiana Telecomunicazioni Siemens S.p.A. Time-slot-allocation network for multi-plex telecommunication system. 3,749,842, Cl. 179-15.0by.

Poretti, Isidoro; and Bernasconi, Gabriele, to Societe Italiana Telecomu2icazioni Siemens S.p.A. Circuit arrangement for the controlled energization of a load. 3,750,141, Cl. 340-347.0da.

Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
Weber, Julius, 3,749,199.

Porter, John Halsted; and Ladd, William Alexander, to Ladd Research Industries, Incorporated. Tilting variable speed rotary shadower. 3,749,052, Cl. 118-48.000.

Porter, Kenneth R.: *See—*
Brown, Gordon M.; and Porter, Kenneth R., 3,749,470.

Potin, Marcel, to Societe Financiere Francaise de Licences et Brevets. Apparatus for making the stops of a slide fastener. 3,748,709, Cl. 29-34.00a.

Powell, James C.; and Treber, Andrew S., to All-Steel Equipment Inc. Method and apparatus for making hex nuts from sheet metal. 3,748,674, Cl. 10-72.00r.

Power Chemco Inc.: *See—*
Appelaniz, Joseph E., 3,749,699.

Power Curbers, Inc.: *See—*
Smith, Roy W., 3,749,504.

Powers, Edward I.: *See—*
United States of America, National Aeronautics and Space Administration, 3,749,156.

PPG Industries, Inc.: *See—*
Cuevas, Ephraim A., 3,749,557.
Dean, Warren E.; and Dorsett, Charles M., 3,749,761.
Lebras, Louis R.; Christenson, Roger M.; and Zwack, Robert R., 3,749,657.

Prakla Seismos GmbH: *See—*
Sender, Friedhelm K., 3,750,188.

Prasse, Herbert F., to Ramsey Corporation. Piston rings with coating impregnated with anti-friction agent. 3,749,559, Cl. 29-191.200.

Pratt, Richard L. Electrical conducting hydraulic hose. 3,749,814, Cl. 174-47.000.

Precismeca Gesellschaft fur Fordertechnik mbH: *See—*
Lachmann, Hans-Peter, 3,748,698.

Preformed Line Products Company: *See—*
Shaw, Charles R., 3,749,816.

Preuss, Friedrich: *See—*

Abendroth, Paul; Alix, Hans; Preuss, Friedrich; and Kunkel, Fred, 3,749,011.

Prezewalski, Zygmunt J. Chimney. 3,749,132, Cl. 138-113.000.

Pridemore, Donald F.: *See—*
Bailey, James R.; Klein, Carl F.; Korta, Lawrence B.; and Pridemore, Donald F., 3,750,165.

Priestley, Harry; and Higgins, John, to Singer Company (U.K.) Limited, The. Hook bar adjustment means for tufting machines. 3,749,036, Cl. 112-79.00r.

Primus, Norman S.; and Hunhoff, Raymond, to National Water Main Cleaning Co. Device for lining pipes with calcite. 3,749,056, Cl. 118-408.000.

Privee, Ralph A.; and Wilchynski, Ronald E. Internal seal for rotary engine. 3,749,532, Cl. 418-137.000.

Prochnow, Lee W. Ball retriever attachment. 3,749,407, Cl. 273-162.00e.

Procter & Gamble Company, The: *See—*
Duncan, Robert C., 3,749,094.
Gedge, Burton H., III, 3,749,671.
Hunter, John Earl, 3,749,588.
Jones, John Paul; and Nicol, Charles H., 3,749,673.
Jones, John Paul; and Nicol, Charles H., 3,749,674.

Proctor, Robert E. Pacing system for conveyances. 3,750,099, Cl. 340-22.000.

Production Technology Inc.: *See—*
Fuller, Francis W.; and Kiwalle, Jozef, 3,748,719.

Production Tube Company, Inc.: *See—*
Andrews, Harry E., 3,749,068.

Properzi, Ilario. Wheel type continuous casting machine, for the production of a continuous metal ingot. 3,749,150, Cl. 164-87.000.

Prussi2, Samuel; and Mason, Jimmie L., to Dart Industries Inc. Self-cleaning sequential valve means with ball check valve. 3,749,291, Cl. 222-402.240.

Pruvot, Francois C., to Regie Nationale des Usines Renault. Refeed and discharge systems of hydraulic circuits of hydrostatic transmissions. 3,748,859, Cl. 60-464.000.

Pryanishnikov, Igor Stepanovich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Puckett, Joe D.: *See—*
Covington, Cecil E.; and Puckett, Joe D., 3,749,515.

Pugh, Evan R.: *See—*
Douglas-Hamilton, Diarmaid H.; and Pugh, Evan R., 3,749,967.

Puls, Louis G. Stairway seat car elevator. 3,749,202, Cl. 187-12.000.

Pusfy, Peter Shirley: *See—*
Wreghitt, Kenneth W.; Pusfy, Peter Shirley; and Munro, Donald Gilbert, 3,749,273.

Putnam, Pual S.: *See—*
Hooper, David W.; and Putnam, Pual S., 3,749,525.

Putt, James S.: *See—*
Barnes, Charles M.; Kosaeski, Raymond, Jr.; and Putt, James S., 3,750,124.

Putterlik, Jan, to Ceskoslovenska akademie ved. Method of automatic control of the discharge of a concentrated traction of solid particles dispersed in liquids from a centrifuge rotor. 3,749,304, Cl. 233-47.00r.

Pyle, Delbert E.: *See—*
Fischer, Paul W.; Maly, George P.; and Pyle, Delbert E., 3,749,554.

Pyles, Robert L.: *See—*
Bottcher, James H.; Pyles, Robert L.; and Rawls, John L., Jr., 3,748,729.

Pyne, John M., to Sci-Tek, Inc. Method and system for processing characters on a real time basis. 3,750,107, Cl. 340-172.500.

Pyramid Derrick & Equipment Corporation: *See—*
Branham, Donald R.; Borg, Paul E.; and Goerner, Douglas C., 3,749,183.

Pyrotector, Incorporated: *See—*
Solomon, Elias E., 3,750,126.

Qeleq Limited: *See—*
Stenning, Patrick John, 3,749,892.

Quantronix Corporation: *See—*
Daly, Richard T.; Kaplan, Robert A.; and Cohen, Martin G., 3,749,476.

Quebec North Shore Paper Company: *See—*
Hamilton, Douglas D., 3,749,143.

Quercetti, Alessandro. Mosaic play. 3,748,752, Cl. 35-27.000.

Quiney, Kenneth Maurice, to Girling Limited. Vehicle brake actuators. 3,748,913, Cl. 74-18.200.

Raba, Joseph W.: *See—*
Whitcomb, Elmer W.; and Raba, Joseph W., 3,748,753.

Rabinowitz, Charles M., to Chandler Evans Inc. Fuel control diagnostic unit. 3,748,897, Cl. 73-118.000.

Racina, Joseph M. Jump cup. 3,749,344, Cl. 248-221.000.

Ract, Bernard, to Juvenilia. Convertible piece of furniture with double-decker beds. 3,748,667, Cl. 5-8.000.

Rader Companies, Inc.: *See—*
Keating, James L., 3,749,323.

Radionics, Incorporated: *See—*
Kuecken, John A., 3,750,181.

Raftis, George Joseph, to Combustion Engineering, Inc. Damper apparatus with fluid seal. 3,749,115, Cl. 137-246.220.

Rain Jet Corp.: *See—*
Hruby, John O., Jr., 3,749,311.

Rait, Joseph M.; Gilmour, Alexander Scott, Jr.; Sellers, Edward C.; and Lindberg, Edward, to Pelorex Corporation. Facsimile transmission system. 3,749,833, Cl. 178-6.60a.

Raitport, Eli. Snap mechanism for use in electrical switches, fluidic switches, valves, etc. 3,749,354, Cl. 251-75.000.

Ralston Purina Company: *See—*
Nahm, Lee Jerome, Jr., 3,749,586.

Ramsey Corporation: *See—*
Prasse, Herbert F., 3,749,559.

Ranging, Inc.: *See—*
Hodges, Marvin P., 3,749,494.

Rapkin, Edward: *See—*
Thomas, Edward W.; and Rapkin, Edward, 3,749,916.

Rath, Ewald, 50% to Schueller, W., & Sohn and 50% Luedorf, Carl & Company. Weaving method for the production of multi-colored ribbons and associated shuttle-type Jacquard ribbon looms. 3,749,139, Cl. 139-416.000.

Rauhui, Michael McKay, to American Cyanamid Company. Carboalkoxy substituted bis-phenyl oxalates as superior chemiluminescent materials. 3,749,679, Cl. 252-188.300.

Rawls, John L., Jr.: *See—*
Bottcher, James H.; Pyles, Robert L.; and Rawls, John L., Jr., 3,748,729.

Raymond, Ian McGrath: *See—*
Burrows, Philip Richard Miles; Raymond, Ian McGrath; and Terry, Michael Peter Alwyn, 3,750,036.

Raynham, Michael B., to Hewlett-Packard Company. Data entry and display apparatus. 3,750,105, Cl. 340-172.500.

Raytheon Company: *See—*
Edgar, Richard H., 3,749,874.

RCA Corporation: *See—*
Ahrens, Paul Raymond; and Bean, Jerome Benjamin, Jr., 3,749,966.
Benyon, Carl W., Jr.; and Leibowitz, Donald, 3,749,984.
Boleky, Edward Joseph, III; and Scott, Joseph Hurlong, Jr., 3,749,614.
Dawson, Robert Herman, 3,749,985.
Fulton, Thomas Philip, 3,750,118.
Gayeski, Thomas Edward Joseph, 3,749,469.
Helbig, Walter Allen, Sr.; and Ross, Walter Lee, 3,750,133.
Tarabocchia, Martin, 3,748,975.
Voigt, Edward Harold; and Hall, William Bernard, 3,749,383.
Vossen, John Louis, Jr., 3,749,658.

RCBS, Inc.: *See—*
Huntington, Fred A., 3,748,950.

Read, William S.: *See—*
United States of America, National Aeronautics and Space Administration, 3,750,131.

Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., to Du Pont de Nemours, E. I., and Company. Laminates containing cross-linked ethylene/carboxylic acid copolymer adhesives. 3,749,637, Cl. 161-184.000.

Redmon, Louis E. Golf tee. 3,749,409, Cl. 273-183.00a.

Reed, Alan B.: *See—*
Stoll, Russell F.; Reed, Alan B.; and Buzek, Vernon T., 3,749,871.

Reed International Limited: *See—*
Burrows, Philip Richard Miles; Hem, Svein; and Terry, Michael Peter Alwyn, 3,749,891.
Burrows, Philip Richard Miles; Raymond, Ian McGrath; and Terry, Michael Peter Alwyn, 3,750,036.

Reed, Noel E., to Hughes Aircraft Company. High-speed switch device. 3,750,061, Cl. 335-168.000.

Reed, Robert D.: *See—*
Zink, John S.; Reed, Robert D.; and Goodnight, Hershel E., 3,749,548.

Reed, Robert D.; Zink, John Smith; and Goodnight, Hershel E., to Zink, John, Company. Smokeless flare pit burner and method. 3,749,546, Cl. 431-5.000.

Reese, James A.: *See—*
Dean, Frank J., Jr.; and Reese, James A., 3,748,997.

Reese, Paul T., to Tecumseh Products Company. Automatic choke system. 3,749,069, Cl. 123-108.000.

Regan, John F.: *See—*
Balzano, Alfiero F.; and Regan, John F., 3,748,878.

Regelson, William, to Hercules Incorporated. Antiviral treatment. 3,749,771, Cl. 424-78.000.

Regie Nationale des Usines Renault: *See—*
Fauquembergue, Jean G.; Lingrand, Michel; Peltier, Henri; and Chatourel, Pierre, 3,749,153.
Pruvot, Francois C., 3,748,859.
Rouvre, Philippe; and Peroy, Francois, 3,750,080.

Regnier, Marc Andre: *See—*
Bolus, Daniel; Lerouge, Claude Paul Henri; and Regnier, Marc Andre, 3,750,144.

Reichard, Thomas E.; and Bever, Thomas L., to Monsanto Company. Process and apparatus for centering unground semiconductor rods. 3,749,499, Cl. 356-150.000.

Reilly, Donald Francis: *See—*
Leone, Louis William; Morange, Theodore Adam; Reilly, Donald Francis; and Schram, Paul James, 3,750,018.

Reisenfeld, Sam: *See—*

Curry, Samuel J.; and Reisenfeld, Sam, 3,750,022.
Reiss, Leon G., to Robbins & Myers, Inc. Electric motor stator. 3,749,956, Cl. 310-216.000.
Reliance Electric Company: *See*—
Abnett, Albert C.; and Boley, Robert A., 3,750,010.
Remington Arms Company, Inc.: *See*—
Borstein, George R., 3,749,242.
Remmington, John Elstow: *See*—
Martin, John Terry; Remmington, John Elstow; and Bedford, John, 3,750,110.
Remscheid, Horst Pawel; and Ruppel, Friedrich, to Barmag Barner Maschinenfabrik Aktiengesellschaft. Extrusion die for underwater granulator. 3,749,536, Cl. 425-190.000.
Renaud, Laurent C.; and Charon, Clarence W., to Owens-Corning Fiberglas Corporation. Formation of non-woven structures from fibrous glass dispersion. 3,749,638, Cl. 162-145.000.
Renaud, Richard. Vehicle safety switch with removable dielectric plug. 3,749,447, Cl. 200-44.000.
Rensink, Chester William: *See*—
Loomis, Robert Jewelle; and Rensink, Chester William, 3,749,438.
Renskers, John O., to Coileraft, Inc. Low reluctance inductor. 3,750,069, Cl. 336-83.000.
Ressorts Du Nord S.A.: *See*—
Duchemin, Michel, 3,749,389.
Retz, George F.: *See*—
Tompkins, Melvin W.; and Retz, George F., 3,748,793.
Rex Chainbelt, Inc.: *See*—
Gley, Paul R., 3,749,434.
Rexroad, James O., to Westinghouse Electric Corporation. Spaced-metallic-plate-type of arc-chute for a switch. 3,749,867, Cl. 200-146.00r.
Reynolds, Donald K. Traffic flow controller. 3,748,782, Cl. 49-49.000.
Reynolds, Donald R., to Entoleter, Inc. Method of impact milling and aspirating scrap insulated wire to recover metal values. 3,749,322, Cl. 241-24.000 7 04/03/72.
Reynolds, Edward Henry; and Edwards, Derek Reginald. High voltage cable. 3,749,812, Cl. 174-25.00r.
Reynolds Metals Company: *See*—
Andrews, William P.; and Beuth, Jack L., 3,749,629.
Spears, William; and Lee, Harry W., Jr., 3,749,240.
Rheaume, Walter A.; and Campman, Arthur R., to Hitcs. Thick fabrics. 3,749,138, Cl. 139-408.000.
Rheinmetall G.m.b.H.: *See*—
Germershausen, Raimund, 3,749,018.
Mindel, Gunter, 3,748,960.
Rheinstahl Aktiengesellschaft: *See*—
Balse, Helmut; and Gorl, Richard, 3,749,193.
Rhodes, David, to General Foods Limited. Producing a foamed liquid. 3,749,378, Cl. 261-78.00a.
Rhodes, Herbert M., to Oil Mop, Inc. Oil mop. 3,748,682, Cl. 15-229.00r.
Richards, J. A., Co.: *See*—
Richards, Robert E., 3,748,941.
Richards, John Rees Morgan: *See*—
Stephenson, Stephen David; and Richards, John Rees Morgan, 3,749,567.
Richards, Robert E., to Richards, J. A., Co. Guide pin assembly for die plate. 3,748,941, Cl. 83-637.000.
Richen Inc.: *See*—
Williams, Arthur; and Davenport, Donald Ray, 3,749,340.
Richter, Rudolf; and Kropp, Walter, to Linde Aktiengesellschaft. Position-control device operated by fluid pressure. 3,748,967, Cl. 91-387.000.
Richter, Sidney B.; and Mayer, David P., to Velsicol Chemical Corporation. Insecticidal and acaricidal compositions and method of combating insects and acarids using dialkylamenobenzhydryl dicarboxylate. 3,749,796, Cl. 424-304.000.
Ricoh Co., Ltd.: *See*—
Kobayashi, Yugoro, 3,748,996.
Yanagawa, Nobuyuki, 3,749,392.
Riedel, Wolfgang: *See*—
Dettke, Manfred; Ludwig, Rolf; and Riedel, Wolfgang, 3,749,650.
Riehl, Frederick W. Method of recovering oil from substantially level formation strata. 3,749,170, Cl. 166-272.000.
Ries, Gordon E. Security device. 3,748,982, Cl. 95-15.000.
Rissi, Erwin: *See*—
Bastian, Jean-Michel; Ebnother, Anton; and Rissi, Erwin, 3,749,729.
Rissinger, John C., to Westinghouse Electric Corporation. Pressure ring for transformer windings. 3,750,070, Cl. 336-84.000.
Ritsema, Craig T.: *See*—
Billerbeck, Fred W.; Everett, Lawrence H.; and Ritsema, Craig T., 3,749,587.
Ritzerfeld, Gerhard. Copying apparatus with different radiation sources. 3,749,490, Cl. 355-89.000.
Roach, Charles C.: *See*—
Kline, William M.; and Roach, Charles C., 3,749,086.
Robandt, William F., II, to Whirlpool Corporation. Lint screen for dryer. 3,748,746, Cl. 34-82.000.
Robbins & Myers, Inc.: *See*—
Reiss, Leon G., 3,749,956.
Roberts, Lester A.: *See*—
Bates, David J.; Silzars, Ariz; Roberts, Lester A.; and Long, James A., 3,749,961.
Roberts, Vasel W.: *See*—
United States of America, National Aeronautics and Space Administration, 3,750,131.
Robertshaw-Controls Company: *See*—
Rosenfeld, Jacob R.; and van Osten, Philip G., 3,749,109.
Robertson, Odes B.: *See*—
Slater, William L.; and Robertson, Odes B., 3,749,377.
Robertson, P. L., Manufacturing Company, Limited: *See*—
Dreger, Geoffrey, 3,748,949.
Robertson Seals, Inc.: *See*—
Lingley, Ronald, 3,749,412.
Robinson, Charles W.; Merklin, Kenneth E.; and Wood, William P., to Marcona Corporation. Liquid jet nozzle. 3,749,314, Cl. 239-206.000.
Robinson, David Everett. Tension control device. 3,749,136, Cl. 139-109.000.
Robison, Leslie P.: *See*—
Taylor, Vincent J.; and Robison, Leslie P., 3,748,954.
Rochat, Freddy. Safety device for automobile vehicles and the like. 3,749,931, Cl. 307-10.0at.
Rockwell, Harvey W., to Allis-Chalmers Corporation. Angle and tilt mechanism for bulldozer. 3,749,182, Cl. 172-804.000.
Rodemann, Alfred H.: *See*—
Breglia, Denis R.; Rodemann, Alfred H.; and Mohon, Windell N., 3,748,751.
Rody, Jean; and Lind, Hanns, to Ciba-Geigy Corporation. Triazolyl ketones. 3,749,732, Cl. 260-308.00a.
Roe, Bruce. Vehicle theft security system. 3,749,930, Cl. 307-10.0at.
Roesch, Egon: *See*—
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,749,724.
Roess, Dieter, to Siemens Aktiengesellschaft. System for controlling light patterns with a high contrast. 3,750,136, Cl. 340-324.00r.
Roethke, Ernst; and Guttler, Hermann, to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung. Thread packaging device with intermediate thread storage means. 3,749,327, Cl. 242-47.12.
Rogers, Edward F.: *See*—
Hannah, John; Graham, Donald W.; and Rogers, Edward F., 3,749,734.
Rogers, Michael John, to Smiths Industries Limited. Electrical dividing circuits. 3,749,937, Cl. 307-225.00c.
Rohde, Raymond, to Phillips Petroleum Company. Addition of oxidation inhibitor to lubricating oil. 3,749,247, Cl. 210-20.00s.
Rohm and Haas Company: *See*—
Walker, Robert Winn, 3,749,668.
Rohr Industries, Inc.: *See*—
Tontini, Remo, 3,749,316.
Rohwer, Werner: *See*—
Knothe, Herbert; Roschmann, Klaus; and Rohwer, Werner, 3,749,828.
Roiser, Josef. Fertilizer spreading mechanism. 3,749,321, Cl. 239-669.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See*—
Abendroth, Paul; Alix, Hans; Preuss, Friedrich; and Kunkel, Fred, 3,749,011.
Romberg, Felix B. Torsion closer device. 3,748,687, Cl. 16-75.000.
Rommelshausen, Gunter Worner, to Daimler-Benz Aktiengesellschaft. Blocking synchronizing arrangement for motor vehicle-change-speed transmissions. 3,749,215, Cl. 192-53.00f.
Rooks, Howard B., to Collins Radio Company. Instrument landing system receiver monitor. 3,750,177, Cl. 343-108.00r.
Root, Robert S.: *See*—
Bush, Carl D.; and Root, Robert S., 3,749,217.
Rorden, Robert J.: *See*—
Dowley, Mark W.; Mefferd, Wayne S.; and Rorden, Robert J., 3,750,049.
Roschmann, Klaus: *See*—
Knothe, Herbert; Roschmann, Klaus; and Rohwer, Werner, 3,749,828.
Rose, Francis Leslie: *See*—
Clark, James; McMenim, Michael Edward; and Rose, Francis Leslie, 3,749,719.
Rose, Walter, KG: *See*—
Konig, Theodor, 3,749,857.
Rose, William W., Jr.: *See*—
George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., 3,749,151.
Roselius, Wilhelm: *See*—
Lehmann, Gunter; Neunhoeffer, Otto; Roselius, Wilhelm; and Vitzthum, Otto, 3,749,698.
Rosenberg, Werner. Electronic key musical instrument. 3,749,806, Cl. 84-1.130.
Rosenberry, George M., Jr.: *See*—
Baumann, Frederick W.; and Rosenberry, George M., Jr., 3,749,953.
Rosendall, Henry J., to Bissell Inc. Floor sweeper with auxiliary surface litter brush means. 3,748,679, Cl. 15-42.000.
Rosenfeld, Jacob R.; and van Osten, Philip G., to Robertshaw-Controls Company. Self-contained relay module unit and system utilizing the same. 3,749,109, Cl. 137-85.000.
Ross, Cecil John, Jr., to Omark Industries, Inc. Stabilizing center drive link for saw chain. 3,748,942, Cl. 83-833.000.
Ross, Gerald; and Lamensdorf, David, to Sperry Rand Corporation. Transmission line presence sensor. 3,750,125, Cl. 340-258.00c.

Ross, Gerald F., to Sperry Rand Corporation. Energy amplifying selector gate for base-band signals. 3,750,025, Cl. 325-321.000.

Ross, Sigmund L.; and Shuffman, Oscar, said Ross, Sigmund L., assor. to said Shuffman, Oscar. Method and apparatus for purifying combustion gases. 3,748,830, Cl. 55-89.000.

Ross, Walter Lee: *See—*
Helbig, Walter Allen, Sr.; and Ross, Walter Lee, 3,750,133.

Roth, Christian: *See—*
Edele, Reinhard; Bauer, Kurt; and Roth, Christian, 3,748,685.

Rothe, Dieter: *See—*
Ludwig, Frank; Bannehr, Konrad; Rothe, Dieter; and Tschischke, Werner, 3,748,871.

Rothfusz, Ralph W.; and Nagy, John R., to Bendix Corporation, The. Acceleration enrichment circuit for electronic fuel control systems. 3,749,065, Cl. 123-32.0ea.

Rotman, Walter; and Karas, Nicholas V., to United States of America, Air Force. Microstrip plasma probe. 3,750,013, Cl. 324-58.000.

Rousseau, Roy S., to Kartridg Pak Co., The. Container filling apparatus. 3,748,818, Cl. 53-88.000.

Roussel-UCLAF: *See—*
Allais, Andre; and Peterfalvi, Michel, 3,749,723.

Rousselet, Andre; and Durand, Pierre, to Hoffmann-La Roche Inc. Device for taking samples of liquid specimens especially for the automatic analysis apparatus. 3,748,911, Cl. 73-423.00a.

Rouviere, Roger Francois: *See—*
Tiraspolsky, Wladimir; and Rouviere, Roger Francois, 3,749,185.

Rouvre, Philippe; and Peroy, Francois, to Regie Nationale des Usines Renault and Automobiles Peugeot. Windscreen washer and wiper timing control having a rotatably mounted control levers. 3,750,080, Cl. 338-172.000.

Rowan, William I.: *See—*
Jones, Robert M.; and Rowan, William I., 3,749,048.

Rowe International, Inc., mesne: *See—*
Gale, Ronald, 3,749,280.

Rowland, Stanley P., to United States of America, Agriculture. Simultaneous introduction of quaternary ammonium salt residues and sulfone residues into fibrous cellulose. 3,749,552, Cl. 8-188.000.

Roycraft, Theodore James; and Shelhan, John Robert, to Bell Telephone Laboratories, Incorporated. Digital amplitude modulator. 3,749,843, Cl. 179-15.00a.

Ruby, Norman. Suction cleaner. 3,748,834, Cl. 55-213.000.

Ruckle, Robert A.: *See—*
Johnson, Wade M.; and Ruckle, Robert A., 3,749,420.

Rudd, Elbert M. Tractor hitch assembly. 3,749,421, Cl. 280-461.00a.

Rudin, Louis. Headboard connector assembly for beds. 3,748,668, Cl. 5-296.000.

Rudnev, Viktor Ivanovich; and Rudnev, Vladimir Ivanovich. Apparatus for making hollow mould cores. 3,749,538, Cl. 425-261.000.

Rudnev, Vladimir Ivanovich: *See—*
Rudnev, Viktor Ivanovich; and Rudnev, Vladimir Ivanovich, 3,749,538.

Rudolph, Ralph G., to United States Steel Corporation. Electrical discharge suppression circuit. 3,749,979, Cl. 317-16.000.

Ruffing, Charles R.: *See—*
Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., 3,749,604.

Rule, A. E., (1965) Limited: *See—*
Tough, William J.; and Hintsa, Roy A., 3,748,799.

Runde, Robert J., to Le Blanc, G., Corporation. Woodwind tenon ring and method. 3,748,946, Cl. 84-380.000.

Ruppel, Friedrich: *See—*
Remscheid, Horst Pawel; and Ruppel, Friedrich, 3,749,536.

Rusanov, Faust Ivanovich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Russell, Curtis J. Pulling tool. 3,748,718, Cl. 29-283.000.

Rutkiewic, Andrew F.: *See—*
Golton, William C.; and Rutkiewic, Andrew F., 3,749,672.

Ryabov, Vadim Alexandrovich: *See—*
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

Ryan, Leo F., to Ecodyne Corporation, mesne. Method and apparatus. 3,749,249, Cl. 210-268.000.

Ryba, Anton. Fan, particularly for cooling systems in motor vehicles. 3,749,519, Cl. 416-241.000.

S.A. Automobiles Citroen: *See—*
Cadiou, Jean, 3,749,466.

Saab-Scania Aktiebolag: *See—*
Granlund, Gosta Holger, 3,750,101.

Saadeh, Mouin I.: *See—*
Ormsbee, Mary K.; Saadeh, Mouin I.; and Skulby, Leonard, 3,749,670.

Saarenketo, Tapio Keikki: *See—*
Bergius, Mikko Hannu Tapani; Saarenketo, Tapio Keikki; and Keskilohko, Altti Kalervo, 3,749,034.

Sabel, Herbert J. Shipping carton closure machine. 3,748,813, Cl. 53-374.000.

Sabelman, Eric E.: *See—*
United States of America, National Aeronautics and Space Administration, 3,750,067.

Sachs, George; Dunn, Anthony Kenneth; and Skuce, William Frederick, to Imperial Chemical Industries, Limited. Dyestuff manufacture. 3,748,745, Cl. 34-10.000.

Sada, Tetuo: *See—*
Matsuzaki, Akio; Tsuruoka, Kanzi; Sada, Tetuo; and Onishi, Hiroshi, 3,749,241.

Sagishima, Takayuki; Sasaki, Reiichi; and Nagaoka, Yoshitomi, to Matsushita Electric Industrial Co., Ltd. Suppression filter for carrier chrominance signals utilizing a topped delay line. 3,749,824, Cl. 178-5.40r.

Sahmel, Otto H., to Bausch & Lomb Incorporated. Fluid sampling device. 3,748,907, Cl. 73-423.00a.

Saito, Takao: *See—*
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kainoka, Toshimitsu, 3,749,220.

Sakakibara, Shupei; and Yamanaka, Tsutomu, to Yoshitomi Pharmaceutical Industries. 1,6-Aminosuberic acid analogue of 7-glycineoxytocin. 3,749,705, Cl. 260-112.500.

Sakamoto, Isamu, to Konan Camera Laboratory Company, Limited. Method and apparatus for making a record carrier for automatic embroidery sewing machine. 3,750,186, Cl. 356-1.000.

Sakautzki, Hans: *See—*
Mayer, Rudolf; Sakautzki, Hans; and Volkheimer, Lothar, 3,750,031.

Sakita, Takashi; Ebisawa, Masaaki; and Mimoto, Hiroshi, to Nisshin Oil Mills, Ltd., The. Process for producing edible protein fiber. 3,749,581, Cl. 99-14.000.

Sako, Shizuka: *See—*
Shino, Masakazu; and Sako, Shizuka, 3,748,695.

Sallberg, David W.; Clark, Peter I.; Parker, Wesley R.; and Nicholson, Robert D., to Koehring Company. High frequency response servo valve. 3,749,128, Cl. 137-625.610.

Salov, Sergei Fedorovich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Sampatacos, Peter M., to General Motors Corporation. Steering knuckle assembly. 3,749,415, Cl. 280-96.100.

Samurt, Norman A.; Geary, Carl H.; and Damratowski, Leonard P., to Carrier Corporation. Motor structure for turbo machines. 3,749,516, Cl. 416-199.000.

Sanchez, Anastacio V. Cable tensioning apparatus. 3,749,364, Cl. 254-67.000.

Sanders Associates, Inc.: *See—*
Williams, Roy M., Jr., 3,750,039.

Sanders, Isaac W., to Automated Copier Systems, Inc. 55 Toner container and holder for electrostatic copiers. . 3,749,287, Cl. 222-181.000.

Sandoz Ltd.: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,749,786.

Sandoz Ltd., a/k/a Sandoz AG: *See—*
Bastian, Jean-Michel; Ebnother, Anton; and Rissi, Erwin, 3,749,729.
Guttmann, Stephan; Sandrin, Edmond; Pless, Janos; and Willems, Hans, 3,749,703.

Sandrin, Edmond: *See—*
Guttmann, Stephan; Sandrin, Edmond; Pless, Janos; and Willems, Hans, 3,749,703.

Sapir, Said, to International Telephone and Telegraph Corporation. Pulse generator. 3,750,128, Cl. 340-263.000.

Sarbacher, Robert I., to Bogue, John C. Primary electrochemical energy cell. 3,749,608, Cl. 136-83.00r.

Sasada, Masaaki: *See—*
Baba, Takeshi; Shibuya, Kenji; Sasada, Masaaki; Nakagawa, Mikio; and Nagao, Taichiro, 3,750,020.

Sasaki, Reiichi: *See—*
Sagishima, Takayuki; Sasaki, Reiichi; and Nagaoka, Yoshitomi, 3,749,824.

Sato, Akira; Ikeda, Tadashi; Nakazawa, Yoshiyuki; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Novel asymmetric carbocyanine dyes. 3,749,714, Cl. 260-240.600.

Sato, Masamichi, to Fuji Photo Film Co., Ltd. Apparatus for developing electrostatic latent image. 3,749,059, Cl. 118-637.000.

Sato, Masamichi; Matsumoto, Seiji; Fukushima, Osamu; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Electrostatic charging process for electrophotographic photosensitive material. 3,749,927, Cl. 250-325.000.

Sato, Yoshimasa; and Togashi, Syozo, to Ikegai Tekko Kabushiki Kaisha. Method of welding thermoplastic band for use in packing machine as well as apparatus relevant thereto. 3,749,622, Cl. 156-157.000.

Satterthwaite, James Glenn, to Johnson Rubber Company, The. Lubrication system for bearings. 3,749,464, Cl. 308-36.100.

Sattley Company: *See—*
Nicholson, Michael, 3,749,998.

Satzinger, Gerhard: *See—*
Herrmann, Wolfgang; and Satzinger, Gerhard, 3,749,721.

Saunders Archery Co.: *See—*
Saunders, Charles A., 3,749,075.

Saunders, Charles A., to Saunders Archery Co. Slingshot with connection for projectile propelling elastic member. 3,749,075, Cl. 124-20.00r.

Sauthier, Pierre, to Omega Louis Brandt & Frere S.A. Variable capacitor. 3,749,986, Cl. 317-249.00r.

Sautter, Helmuth Otto: *See—*
Burus, Harry Shaner; Miller, Richard Carrel; and Sautter, Helmuth Otto, 3,749,829.

Savage, Mary Jane: *See—*
Williams, David R., 3,749,092.

Savin Business Machines Corporation: *See—*
Hastwell, Peter J., 3,749,050.

Sawicki, Joseph J.; and Sharrow, John A., to Bendix Corporation, The. Integrity monitor for ILS receiver with automatic change of monitor threshold sensitivity. 3,750,176, Cl. 343-107.000.

Scala, Luciano C.: *See—*
Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., 3,749,604.

Scammon, Lawrence W., Jr.; Grant, Clarence L.; and Wilks, Phillip H., to Humphreys Corporation. Processing of silicate ores and product thereof. 3,749,763, Cl. 423-608.000.

Schaefer, Robert H.; and Marlow, Jerry R., to General Motors Corporation. Power train and control system. 3,748,931, Cl. 74-867.000.

Schafft, Hugo W., to Motorola, Inc. Resistive electrode for an electrostrictive transducer. 3,749,855, Cl. 179-110.00f.

Scheiterbauer, Adolf R.; and Stickdorn, Helmut, to Bunker Ramo Corporation, The. Miniature potentiometer with stop rib and sealing means. 3,750,079, Cl. 383-164.000.

Schering Aktiengesellschaft: *See—*
Wiechert, Rudolf; and Steinbeck, Hermann, 3,749,742.

Schick Incorporated: *See—*
Bartram, Nial; and Foard, James H., Jr., 3,748,730.
Frantz, Dale E.; and Shortlidge, Donlad L., 3,748,732.

Schilling, Helmut W.: *See—*
Cramer, Bernhard; and Schilling, Helmut W., 3,750,150.

Schilling, Robert W.: *See—*
Christensen, Eric A.; and Schilling, Robert W., 3,749,336.

Schilter, Max, to Contraves AG. Pneumatic display. 3,748,764, Cl. 40-37.000.

Schindler, Walter: *See—*
Blattner, Hans; and Schindler, Walter, 3,749,790.

Schleyerbach, Rudolf; and Geiger, Rolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Secretin preparation having prolonged action and the procedure of manufacture. 3,749,774, Cl. 424-177.000.

Schlitz, Jos., Brewing Company: *See—*
Pagdin, William G.; and Constable, Charles F., 3,749,004.

Schlumberger Technology Corporation: *See—*
Baker, John H., 3,750,009.
Young, David E., 3,749,166.
Young, David E., 3,749,167.
Zill, Fred W., 3,750,098.

Schmersal, Larry J.; and Wojcik, Gerald E., to Owens Illinois, Inc. Gas discharge panel containing flexible electrical connections. 3,749,959, Cl. 313-188.000.

Schmersal, Larry J., to Owens-Illinois, Inc. Method of operating gas discharge panel. 3,749,970, Cl. 315-169.000.

Schmid, Eckhardt; and Kohler, Alfred, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Universal joint construction. 3,749,431, Cl. 287-90.00r.

Schmidt, Charles E., to GTE Automatic Electric Laboratories Incorporated. Inductorless lowpass filter utilizing frequency dependent negative resistors. 3,750,037, Cl. 328-167.000.

Schmidt, Donald L.: *See—*
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,737.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,738.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,739.

Schmidt, Franz: *See—*
Bronstert, Klaus; Schmidt, Franz; and Schuette, Wilhelm, 3,749,755.

Schmidt, Fritz: *See—*
Bogner, Gunther; and Schmidt, Fritz, 3,749,811.

Schmidt, Gunther; Engelhorn, Robert; and Leitold, Matyas, to Boehringer Ingelheim G.m.b.H. Pharmaceutical compositions containing a tricyclic heterocyclic amide of a diallylamino-alkanoic acid. 3,749,785, Cl. 424-256.000.

Schmidt, Willi; Berzbach, Rainer; and Bergen, Klaus, to Kampf, Erwin, Maschinenfabrik. Clamp for biaxial stretching machines. 3,748,704, Cl. 26-62.00b.

Schmitt, Hubert A., to Boeing Company, The. Fatigue resistant fasteners. 3,748,948, Cl. 85-1.00r.

Schneider, Richard S.: *See—*
Leute, Richard K.; and Schneider, Richard S., 3,749,645.

Schneider, Richard S.; and Ullman, Edwin F., to Syntex Associates. Enzyme assay by metering changes of stable free radicals. 3,749,644, Cl. 195-103.50r.

Schnell, Ludwig, to Schuttgutfordertechnik AG. Dredging machinery with swinging double ended scoop. 3,748,760, Cl. 37-58.000.

Schneller, George H.; Levin, Howard J.; and Sklar, Stanley, to American Home Products Corporation. Stable solutions of sodium diphenylhydantoin. 3,749,779, Cl. 424-273.000.

Scholes, Thomas: *See—*
Winterburn, Charles Barry; and Scholes, Thomas, 3,748,686.

Schoor, Manfred; Schrinner, Elmar; and Schutze, Eberhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Acylaminopenicillanic acids and salts thereof. 3,749,711, Cl. 260-239.100.

Schrader, James H.; and Couch, Richard H., to United States of America, National Aeronautics and Space Administration. Apparatus for aiding a pilot in avoiding a midair collusion between aircraft. 3,750,168, Cl. 343-6.50r.

Schram, Paul James: *See—*
Leone, Louis William; Morange, Theodore Adam; Reilly, Donald Francis; and Schram, Paul James, 3,750,018.

Schrecongost, Ray B., to Hammond Corporation. Integrated circuit synthesis and bright wave organ system. 3,748,944, Cl. 84-1.220.

Schriever Design Co., Inc.: *See—*
Schriever, Ferdinand J., 3,749,537.

Schriever, Ferdinand J., to Schriever Design Co., Inc. Mold base for injection molding apparatus. 3,749,537, Cl. 425-242.000.

Schrinner, Elmar: *See—*
Schoor, Manfred; Schrinner, Elmar; and Schutze, Eberhard, 3,749,711.

Schroder, Hans-Georg: *See—*
Geiger, Rolf; and Schroder, Hans-Georg, 3,749,704.

Schroter, Herbert; and Koblo, Jochen, to Kalle Aktiengesellschaft. Process and apparatus for developing light-sensitive material. 3,748,995, Cl. 95-89.00g.

Schubert, Thomas J., to Pennwalt Corporation. High speed amalgamator universal capsule holder. 3,749,390, Cl. 269-254.000.

Schueller, W., & Sohn: *See—*
Rath, Ewald, 3,749,139.

Schuette, Wilhelm: *See—*
Bronstert, Klaus; Schmidt, Franz; and Schuette, Wilhelm, 3,749,755.

Schukrafft, Friedrich, to Ludwigsburger Maschinenbau GmbH. Boring machines. 3,749,508, Cl. 408-156.000.

Schult, Thomas H.: *See—*
Heider, James Elmer; and Schult, Thomas H., 3,748,868.

Schultz, Donald W. Sno-throw and pavement cleaner combination. 3,748,675, Cl. 15-4.000.

Schultz, Herman J. Remoistening apparatus. 3,749,049, Cl. 118-2.000.

Schulze, Erwin E., Jr.: *See—*
Lykken, Lowell O.; and Schulze, Erwin E., Jr., 3,749,333.

Schumacher, Percy W., Jr., to Murphy, G. W., Industries, Inc. Drill bit. 3,749,188, Cl. 175-364.000.

Schumer, Henry A., to Angstrohm-Precision Incorporated. Mounting element for electrical components. 3,749,347, Cl. 248-309.000.

Schurmann, Helmut: *See—*
Esser, Klaus; Schurmann, Helmut; Heitner, Alfred; and Hildebrandt, Norbert, 3,749,908.

Schuttgutfordertechnik AG: *See—*
Schnell, Ludwig, 3,748,760.

Schutze, Eberhard: *See—*
Schoor, Manfred; Schrinner, Elmar; and Schutze, Eberhard, 3,749,711.

Schwalm, Glendon Henry: *See—*
Neiman, Richard Alvin; and Schwalm, Glendon Henry, 3,748,932.

Schwarb, Gustav: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,749,786.

Schwartz, Martin L.: *See—*
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,749,731.

Schwartz, Robert E.: *See—*
Cook, Henry S.; and Schwartz, Robert E., 3,749,388.

Schwarze, Werner; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Herbicides including thiocarbamoylalkylamino-s-triazines. 3,749,565, Cl. 71-93.000.

Schweihs, Jess J.: *See—*
Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., 3,749,008.

Schweikher, Ernest W., to Chromium Corporation of America. Internal combustion engine cylinder liners. 3,749,072, Cl. 123-193.00c.

Schweitzer, Robert W.; and Drury, Harvey J., to Philco-Ford Corporation. Process for controlling cathode ray tube cutoff voltage by cathode insertion with accelerating grid compensation. 3,748,708, Cl. 29-25.150.

Schwien Engineering, Inc.: *See—*
Music, William A., 3,748,891.

Schwimmer, Sigmund: *See—*
Kurtzman, Ralph H., Jr.; and Schwimmer, Sigmund, 3,749,584.

Sci-Tek, Inc.: *See—*
Pyne, John M., 3,750,107.

Scientific Kit Corporation: *See—*
Guild, Lloyd V., 3,748,902.

SCM Corporation: *See—*
Blishak, Theodore L., 3,750,139.
Guzak, John, Jr., 3,749,223.
Scocos, Peter C.; and Miller, Frank L., 3,749,692.

Scocos, Peter C.; and Miller, Frank L., to SCM Corporation. Aqueous latex caulking composition. 3,749,692, Cl. 260-29.6ma.

Scott, Joseph Hurlong, Jr.: *See—*
Boleky, Edward Joseph, III; and Scott, Joseph Hurlong, Jr., 3,749,614.

Sczerba, Stanley T.: *See—*

Dortenzu, Alexander I.; and Sczerba, Stanley T., 3,749,116.
S.D.C. Products (Electronics) Limited: *See—*
Cooper, Frederick David, 3,750,085.
Searth, James Slocum. Pilot data system. 3,750,166, Cl. 343-6.0tv.
Seaton, William Joe, to Garside Corporation. Alarm system. 3,750,162, Cl. 343-5.0pd.
Secoh Giken Company Limited: *See—*
Ban, Itsuki, 3,748,989.
Sedlacek, Herbert: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.
Seelnadt, Karl H.; and Wentworth, Hobart L., to Sola Basic Industries, Inc. Fluid bed furnace. 3,749,805, Cl. 13-20.000.
Seemann, James Marion: *See—*
Stearns, Burdett Kinney; Graham, David Alan; Seemann, James Marion; and Zink, George, 3,748,958.
Seismic Logs, Inc.: *See—*
Morris, Harold B., 3,749,948.
Sek, Kazunori: *See—*
Kazama, Toshio; and Sek, Kazunori, 3,749,522.
Sellers, Edward C.: *See—*
Rait, Joseph M.; Gilmour, Alexander Scott, Jr.; Sellers, Edward C.; and Lindberg, Edward, 3,749,833.
Sels, Francis Jeanne: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,749,574.
Seltzer, David A.: *See—*
Dahms, Harald; Levy, Gabor B.; and Seltzer, David A., 3,749,659.
Sender, Friedhelm K., to Prakla Seismos GmbH. Method and apparatus for radio navigation. 3,750,188, Cl. 343-112.000.
Senter, Louis; and Johnson, Robert E., to Whittaker Corporation. Wheel adaptation means. 3,749,450, Cl. 301-9.0dn.
Sentex Corporation: *See—*
Aileo, Jackson A., 3,748,657.
Sessler, Gerhard Martin; West, James Edward; and Hirsch, Alfred E., Jr., to Bell Telephone Laboratories, Incorporated. Multi-unit electret touch selector. 3,750,149, Cl. 340-365.00c.
Sestita, Joseph J. Hair-coloring method and apparatus therefor. 3,749,105, Cl. 132-7.000.
Shand, John Richard: *See—*
Harper, George S.; and Shand, John Richard, 3,749,873.
Shariff, Sadig A.: *See—*
Wilson, John R.; and Shariff, Sadig A., 3,749,862.
Sharonoy, Georgy Ivanovich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.
Sharrow, John A.: *See—*
Sawicki, Joseph J.; and Sharrow, John A., 3,750,176.
Shattes, Walter J.: *See—*
Gregory, Eric; Marancik, William G.; and Shattes, Walter J., 3,749,547.
Shatz, Malcolm H.: *See—*
Leon, Edward; and Shatz, Malcolm H., 3,749,611.
Shavel, John, Jr.: *See—*
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,749,731.
Shaw, Charles R., to Preformed Line Products Company. Conductor breakout. 3,749,816, Cl. 174-70.00r.
Shay, Joseph Leo: *See—*
Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,750,046.
Shealy, Alexander N. Expanded self-damping electrical conductor. 3,749,813, Cl. 174-42.000.
Sheffer, Bernard Clifford: *See—*
Hoover, James Eugene; Houser, Robert Wilson; and Sheffer, Bernard Clifford, 3,748,715.
Sheka, Valdimir Pavlovich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.
Sheker, Roger N.; and Ballou, Raymond J., to Comtec Industries, Inc. Digital logic test probe for indicating both signal levels as well as a count of changes in signal levels. 3,750,015, Cl. 324-72.500.
Shelby, Richard, to Monsanto Company. Sealing construction for use in forming articles from styrene sheet. 3,749,542, Cl. 425-388.000.
Sheldon, Edward Emanuel. System for X-ray image intensification. 3,749,920, Cl. 250-213.0vt.
Shelhan, John Robert: *See—*
Roycraft, Theodore James; and Shelhan, John Robert, 3,749,843.
Shell Oil Company: *See—*
Stephens, Robert D.; and Kray, William C., Jr., 3,749,700.
Shelton, Joe: *See—*
Hagood, Jerry W.; and Shelton, Joe, 3,749,915.
Sheppard, Gordon M.; deceased (by Brodeur, Dame Lillian; Sheppard, Jack; and Br5deur, Philip; executors and trustees). Wire furring hangers. 3,748,808, Cl. 52-665.000.
Sheppard, Jack: *See—*
Sheppard, Gordon M., 3,748,808.
Sherwood Medical Industries Inc.: *See—*
Klohr, Robert E. N., 3,749,087.
Shiber, Samuel, to Borg-Warner Corporation. Control system for multiple driving axle vehicle. 3,748,928, Cl. 74-711.000.
Shibuya, Kenji: *See—*
Baba, Takeshi; Shibuya, Kenji; Sasada, Masaaki; Nakagawa, Mikio; and Nagao, Taichiro, 3,750,020.
Shiga, Tetsuya; Inagaki, Yutaka; and Matsubara, Hironaga, to Sumitomo Electric Industries, Ltd. Insulated cable having strand shieiding semi-conductive layer. 3,749,817, Cl. 174-102.0sc.
Shimada, Sugao: *See—*
Yamamoto, Yasuhiko; Shimada, Sugao; and Matsuno, Suguru, 3,749,468.
Shimadgu Seisakusho Ltd.: *See—*
Aihara, Wataru; and Kawamoto, Takashi, 3,748,707.
Shimadzu Seisakusho Ltd.: *See—*
Shimomura, Teiichi, 3,749,498.
Shimomura, Teiichi, to Shimadzu Seisakusho Ltd. Double-pass type double monochromator. 3,749,498, Cl. 356-101.000.
Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,749,710.
Shinko Wire Co., Ltd.: *See—*
Tomioka, Hiroyuki, 3,748,723.
Shino, Masakazu; and Sako, Shizuka. Rotary drafting apparatus. 3,748,695, Cl. 19-293.000.
Shionogi & Co., Ltd.: *See—*
Komeno, Taichiro, 3,749,778.
Shipman, Clarence S., to Ingersoll-Rand Company. Retaining carbide in rock drill bits. 3,749,190, Cl. 175-410.000.
Shirwo, Darold M.: *See—*
Bass, Sidney; Benson, John T.; and Shirwo, Darold M., 3,748,765.
Shoffner, James P., to Fluorodynamics, Inc. Securing and/or forming of coverings and the like of tetrafluorinated ethylene and fluorinated ethylene polymers. 3,749,621, Cl. 156-86.000.
Shoji, Setsuo: *See—*
Ogawa, Kiichi; Shoji, Setsuo; and Sukegawa, Tomoyoshi, 3,748,385.
Shortlidge, Donlad L.: *See—*
Frantz, Dale E.; and Shortlidge, Donlad L., 3,748,732.
Shuffman, Oscar: *See—*
Ross, Sigmund L.; and Shuffman, Oscar, 3,748,830.
Shupe, David M., to Bendix Corporation, The. Coherent optical device utilizing an organic dye cell to destroy the coherence of a wave energy signal. 3,749,475, Cl. 350-160.00r.
Siddall, John B.; and Liddell, Norman E., to Zoecon Corporation. Alkyl-substituted monounsaturated keto esters. 3,749,743, Cl. 260-410.900.
Siddall, John B.; and Henrick, Clive A., to Zoecon Corporation. Oxo-substituted α~β-unsaturated alkylated fatty acids and esters. 3,749,744, Cl. 260-410.90r.
Siemens Aktiengesellschaft: *See—*
Bogner, Gunther; and Schmidt, Fritz, 3,749,811.
Harz, Hermann, 3,749,990.
Latussek, Hans Peter; and Petrak, Heinz, 3,749,457.
Lutz, Herbert; Marhoff, Paul; Pfeiler, Manfred; Frunn, Klaus; and Goering, Ulrich, 3,749,868.
Roess, Dieter, 3,750,136.
Thomas, Johann, 3,749,804.
Wiesner, Richard, 3,748,726.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Cavazza, Claudio; Bianchi, Giancarlo Eletti; and Diamanti, Enrico, 3,749,712.
Silver, Samuel. Sandal. 3,748,757, Cl. 36-11.500.
Silzars, Ariz: *See—*
Bates, David J.; Silzars, Ariz; Roberts, Lester A.; and Long, James A., 3,749,961.
Simon, Fred G. Bowling ball handgrip gauge and drilling jig for use therewith. 3,748,743, Cl. 33-174.00f.
Simon, James Louis: *See—*
Knollman, Dieter John Henry; and Simon, James Louis, 3,749,848.
Simon, Klaus: *See—*
Detmann, Walter; Meid, Gerhard; and Simon, Klaus, 3,749,884.
Simonnet, Jacques Louis Paul: *See—*
Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, 3,748,826.
Simpkins, Lorenz G., to United States of America, National Aeronautics and Space Administration. Television multiplexing system. 3,749,831, Cl. 178-6.800.
Sinclair, John C.: *See—*
Ely, William G.; and Sinclair, John C., 3,749,853.
Singer Company (U.K.) Limited, The: *See—*
Priestley, Harry; and Higgins, John, 3,749,036.
Singer Company (U.K.) Limited, The, mesne: *See—*
Parsons, Ronald, 3,748,914.
Singer Company, The: *See—*
Fritts, Russell A., 3,749,039.
Singer, M. Leonard; and Woletz, Robert M. Device for securing articles on a mounting base. 3,748,879, Cl. 70-232.000.
Siviy, George: *See—*
Patel, Nagar J.; and Siviy, George, 3,750,059.
Skelley, John W.: *See—*

Farrell, Robert C.; Skelley, John W.; Milton, Thomas J.; and Piziks, Henry I., 3,748,921.

SKF Industrial Trading and Development Company N.V.: *See*—
Asberg, Sturi, 3,749,416.

SKF Kugellagerfabriken Gesellschaft mit beschrankter Haftung: *See*—
Wendel, Gunther, 3,749,462.

Sklar, Stanley: *See*—
Schneller, George H.; Levin, Howard J.; and Sklar, Stanley, 3,749,779.

Skraba, Frank W., to Phillips Petroleum Company. Purification of HF catalyst in alkylation process. 3,749,753, Cl. 260-683.480.

Skuce, William Frederick: *See*—
Sachs, George; Dunn, Anthony Kenneth; and Skuce, William Frederick, 3,748,745.

Skulby, Leonard: *See*—
Ormsbee, Mary K.; Saadeh, Mouin I.; and Skulby, Leonard, 3,749,670.

Skurski, James K.: *See*—
Brandt, Edison R.; Cronin, David V.; and Skurski, James K., 3,748,980.

Slabaugh, Edward J., to Ion Equipment Corporation. Rotary substrate holder assembly. 3,749,058, Cl. 118-500.000.

Slagle, William E., to Lincoln-Hall Research Company. Positive displacement pump for dispensing a metered quantity of liquid. 3,749,527, Cl. 417-395.000.

Slater, William L.; and Robertson, Odes B., to Texaco, Inc. Orifice scrubber for removing solid particles from high pressure gas. 3,749,377, Cl. 261-78.00r.

Sliker, Lawrence S., to International Scanning Devices, Inc. Electroluminescent device. 3,749,977, Cl. 315-276.000.

Slingluff, Eugene L.; and Ostoich, Eli, to Sunlite Plastics, Inc. Radiographically opaque plastic tubing. 3,749,134, Cl. 138-177.000.

Sloan Valve Company: *See*—
Billeter, Henry R., 3,748,837.

Slof, Alius; and Smejkal, Vladimir, to Vyzkumny ustav pletarsky. Working element of a knitting machine provided with at least one butt. 3,748,875, Cl. 66-123.000.

Smejkal, Vladimir: *See*—
Slof, Alius; and Smejkal, Vladimir, 3,748,875.

Smith, Carl A.: *See*—
Love, John J.; and Smith, Carl A., 3,749,120.

Smith, Charles F.: *See*—
Hill, Donald G.; Smith, Charles F.; and Kucere, Clare H., 3,749,173.

Smith, Daniel J.: *See*—
Krackenberger, Herman F.; and Smith, Daniel J., 3,749,616.

Smith, Duane R., to Caterpillar Tractor Company. Lubricated fairlead roller assembly. 3,748,711, Cl. 29-116.00r.

Smith, George L., Jr.; and Diekhoff, Hans H., to Aluminum Company of America. Lock-down for a pull tab on a container wall. 3,749,275, Cl. 220-48.000.

Smith, Herchel: *See*—
Strike, Donald P.; and Smith, Herchel, 3,749,741.

Smith, Hugh B.: *See*—
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,737.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,738.
Hatch, Melvin J.; Schmidt, Donald L.; and Smith, Hugh B., 3,749,739.

Smith, James E.; and Oswald, Richard J. Adjustable drip shield for paint roller. 3,748,683, Cl. 15-248.00a.

Smith, Janet L. Adjustable scarf. 3,748,661, Cl. 2-207.000.

Smith, John F., to Narco Scientific Industries, Inc. Switchable band pass-band reject filter apparatus. 3,750,057, Cl. 333-76.000.

Smith Kline & French Laboratories: *See*—
Loev, Bernard, 3,749,728.

Smith Kline & French Laboratories, Inc.: *See*—
Sutton, Blaine M., 3,749,740.

Smith, Mark W.: *See*—
Lockerd, Robert M.; Smith, Mark W.; Cooper, Ray E.; and Goode, George E., 3,750,175.

Smith, Paul Joseph: *See*—
Duff, Joseph Howard; and Smith, Paul Joseph, 3,748,737.

Smith, Raymond P., Jr. Wheel dolly. 3,749,265, Cl. 214-331.000.

Smith, Richard Miles, to United States of America, Navy. Multitrack radar display console. 3,750,109, Cl. 340-172.00s.

Smith, Roy W., to Power Curbers, Inc. Apparatus for forming a continuous curb structure. 3,749,504, Cl. 404-84.000.

Smith, Sam L.: *See*—
Cook, Henry S.; and Smith, Sam L., 3,749,661.

Smith, Sidney T.; and Winslow, Lester M., to United States of America, Navy. Traveling wave tube with heat pipe cooling. 3,749,962, Cl. 315-35.000.

Smith-Vaniz, William Reid: *See*—
Angus, David R.; and Smith-Vaniz, William Reid, 3,750,103.

Smithfield Fibers, Inc.: *See*—
Blezard, Robert C., 3,748,874.

Smiths Industries Limited: *See*—
Rogers, Michael John, 3,749,937.

Smits, Denis L., to Superseal Corporation. Sliding glass panel. 3,748,784, Cl. 49-425.000.

Smoot-Holman Company: *See*—
Jones, Bill F.; and Stewart, William J., 3,749,968.

Smukler, Karen B. Film strip. 3,749,486, Cl. 353-120.000.

Snowden, Bryan T., to FEI, Inc., mesne. Vaporizing apparatus for treatment of animal carcasses. 3,748,691, Cl. 17-11.200.

Societa' Italiana Resine S.p.A.: *See*—
Vargiu, Silvio; Passalenti, Beppino; and Abruzzi, Pierluigi, 3,749,689.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Fornasiero, Paolo; and Tomasi, Sergio, 3,749,839.
Fornasiero, Paolo; and Tomasi, Sergio, 3,749,840.
Placente, Luigi; and Gandolfi, Giovanni, 3,749,847.
Poretti, Isidoro, 3,749,842.

Societe a Responsabilite Limitee dite: Royoda: *See*—
Maillocheau, Camille Jean, 3,748,703.

Societe Anonyme dite: L'Oreal: *See*—
Kalopissis, Gregoire; and Bugaut, Andree, 3,749,768.

Societe Anonyme Francaise du Ferodo: *See*—
Lepelletier, Pierre Andre Georges, 3,748,930.

Societe Anonyme: Glaenzer Spicer: *See*—
Orain, Michel, 3,748,869.

Societe d'Appareillages et Materiels de Servitudes, "A.M.S." Societe Anonyme: *See*—
Hellouin de Menibus, Olivier Andre Henry Louis, 3,748,898.

Societe Financiere Francaise de Licences et Brevets: *See*—
Potin, Marcel, 3,748,709.

Societe Generale de Constructions Electriques et Mecaniques (Alsthom): *See*—
Carrasse, Jean, 3,749,026.

Societe Italiana Telecomu2icazioni Siemens S.p.A.: *See*—
Poretti, Isidoro; and Bernasconi, Gabriele, 3,750,141.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bousseau, Marcel-Gustave; and Berihoumifux, Robert, 3,749,528.

Societe Nouvelle de Roulements: *See*—
Beauchet, Jean, 3,748,935.

Soehngen, John W., to Celanese Corporation. Apparatus for producing non-woven fibrous products. 3,749,633, Cl. 156-441.000.

Sokolies, Alfred Hienz. Sealed live plant container and method. 3,748,783, Cl. 47-58.000.

Sola Basic Industries, Inc.: *See*—
Seelnadt, Karl H.; and Wentworth, Hobart L., 3,749,805.

Solomon, Elias E., to Pyrotector, Incorporated. Proximity detector. 3,750,126, Cl. 340-258.00c.

Sony Corporation: *See*—
Morita, Akio, 3,748,664.

Sorgel, Rolf: *See*—
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.

Spaller, Albert E.: *See*—
Galbreath, Paul J.; Spaller, Albert E.; and Stockbridge, Bruce W., 3,749,539.

Sparlin, Derry D.; and Hunt, Mack W., to Continental Oil Company. Composition and method for selectively modifying the permeability of subterranean formations. 3,749,589, Cl. 106-123.000.

Spears, William; and Lee, Harry W., Jr., to Reynolds Metals Company. Apparatus for and method of classifying empty containers. 3,749,240, Cl. 209-75.000.

Sperry Rand Corporation: *See*—
Bottcher, James H.; Pyles, Robert L.; and Rawls, John L., Jr., 3,748,729.
Ross, Gerald; and Lamensdorf, David, 3,750,125.
Ross, Gerald F., 3,750,025.
Strenglein, Harry F., 3,750,169.

Spietschka, Ernst: *See*—
Fuchs, Otto; and Spietschka, Ernst, 3,749,726.

Spillane, Matthew L., to Atlas Chemical Industries, Inc. Method and apparatus for detecting defective shells. 3,748,893, Cl. 73-49.200.

Sprague, Robert W.: *See*—
Cromwell, Thomas M.; and Sprague, Robert W., 3,749,792.

Squibb, E. R., & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; Maurer, Barbara V.; and Narayanan, Venkatachala L., 3,749,717.

Stacey, Gilbert Joseph: *See*—
Hepworth, Walter; and Stacey, Gilbert Joseph, 3,749,787.

Stach, Kurt: *See*—
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,749,724.

Staes, Karel Germanus; and Natens, Luc Yves, to Agfa-Gevaert N.V. Method for determining the exposure of a recording material. 3,748,981, Cl. 95-12.200.

Standard Oil Company: *See*—
Micklewright, Donald G., 3,749,647.

Staneff, Stefan, to Industriewerk Schaeffler, OGH. Drafting system having a supporting roll for offset top feed roll. 3,748,694, Cl. 19-258.000.

Stanely, Gerald R., to International Radio & Electronics Corporation. Graphic equalizer circuit. 3,750,044, Cl. 330-126.000.

Stanford Research Institute: *See*—
Hill, Robert M., 3,749,909.
Macovski, Albert, 3,749,493.

Stansbury, Patrick H., to ASC Industries, Inc. Apparatus for forming belled pipe couplings. 3,749,543, Cl. 425-393.000.

Star-Kist Foods, Inc.: *See*—
Vidjak, Frank V., 3,749,000.

Stark, Hubert, to Terramot-Beteiligungs-GmbH. Power shovel with scraper blade releasably attached to the shovel bucket. 3,749,262, Cl. 214e145.000.

Starr, Carrol Dean; Steinitz, Robert; and Wang, Teh Po, to Driver, Wilbur B., Company. Electrical resistance alloys. 3,749,569, Cl. 75-170.000.

Starvaski, Raymond R.: *See—*
Hill, William J.; Starvaski, Raymond R.; and Woodrow, Harold E., 3,749,256.

Stauffer Chemical Company: *See—*
Baker, Don R., 3,749,730.
Fancher, Llewellyn W., 3,749,747.
Fancher, Llewellyn W., 3,749,775.
Gutman, Arnold D., 3,749,748.

Stearns, Burdett Kinney; Graham, David Alan; Seemann, James Marion; and Zink, George, to General Electric Company. Firearm chamber seal. 3,748,958, Cl. 89-26.000.

Steel Web Corporation: *See—*
Jackson, Edgar D., 3,748,809.

Stehle, Randall G.; and Oesterling, Thomas O., to Upjohn Company, The. Stable composition for dispensing PGE. 3,749,800, Cl. 424-318.000.

Stein, Bert: *See—*
Jonas, Hans; and Stein, Bert, 3,749,900.

Stein, Robert George; and Nordeen, Carl William, to Abbott Laboratories. Method of preparing 2,3,dihydro-1H-pyrido[2,3-b] [1,4]-thiazin-2-ones. 3,749,715, Cl. 260-243.00r.

Steinbeck, Hermann: *See—*
Wiechert, Rudolf; and Steinbeck, Hermann, 3,749,742.

Steinitz, Robert: *See—*
Starr, Carrol Dean; Steinitz, Robert; and Wang, Teh Po, 3,749,569.

Steinle, John T.; and Brooks, Carl H., to Heinz, H. J., Company. Apparatus and method for removing and storing paste-like material from containers. 3,749,264, Cl. 214-302.000.

Stella, Joseph A., to Polaroid Corporation. Photographic film cassette having an improved film-engaging pad for film processing. 3,748,994, Cl. 95-89.00r.

Stenning, Patrick John, to Qeleq Limited. Accountancy system. 3,749,892, Cl. 235-150.500.

Stephens, Robert D.; and Kray, William C., Jr., to Shell Oil Company. Poly(phenylenecarbides). 3,749,700, Cl. 160-80.00p.

Stephenson, Stephen David; and Richards, John Rees Morgan, to National Research Development Corporation. Process for reducing iron oxide fume formation during refining of steel. 3,749,567, Cl. 75-60.000.

Sterling Drug Inc.: *See—*
Harrison, Thomas S., 3,749,296.

Sterner, Russell L., to Kidde, Walter, & Company Inc., mesne. Adjustable and replaceable lateral guides for telescopic crane boom. 3,748,807, Cl. 52-632.000.

Stevens, J. P., & Co., Inc.: *See—*
Hartgrove, Earl H., Jr., 3,749,597.

Stewart, James M., to Stewart Research, Inc. Combination aspirator and fluid delivering surgical instrument. 3,749,090, Cl. 128-240.000.

Stewart Research, Inc.: *See—*
Stewart, James M., 3,749,090.

Stewart, Theodore C. Landing gear lever knob. 3,749,473, Cl. 350-156.000.

Stewart, William F., to Perkins Engines Limited. Crankshaft balance weights and method of assembly. 3,748,925, Cl. 74-603.000.

Stewart, William J.: *See—*
Jones, Bill F.; and Stewart, William J., 3,749,968.
Meschke, Harry H.; and Stewart, William J., 3,749,226.

Stewart, William R., Jr.: *See—*
Kolpek, Robert A.; and Stewart, William R., Jr., 3,749,849.

Stibbs, Donald; Brown, Clifford Gordon; and Thompson, Raymond, to United States Borax & Chemical Corporation. Cold-pressed compositions. 3,749,571, Cl. 75-204.000.

Stickdorn, Helmut: *See—*
Scheiterbauer, Adolf R.; and Stickdorn, Helmut, 3,750,079.

Stingelin, Valentin, to Battelle Memorial Institute. Installation for making sheet glass. 3,749,563, Cl. 65-182.00r.

Stivers, George S.: *See—*
Koomey, Paul C.; Stivers, George S.; and Barker, Theodore R., II, 3,750,096.

Stock, Erwald E. Wheel construction for silo unloader. 3,749,259, Cl. 214-17.0db.

Stockbridge, Bruce W.: *See—*
Galbreath, Paul J.; Spaller, Albert E.; and Stockbridge, Bruce W., 3,749,539.

Stoffel, Charles R. Spring type leg exercise device. 3,749,400, Cl. 272-83.00r.

Stoll, H., and Company: *See—*
Hadam, Wilhelm; and Muller, Adam, 3,748,872.

Stoll, Russell F.; Reed, Alan B.; and Buzek, Vernon T., to Woodhead, Daniel, Inc. Pawl and ratch switch with flexible U-shaped pawl member. 3,749,871, Cl. 200-156.000.

Stone, Irwin M., to Baxter Laboratories, Inc. Chillproofing fermented malt beverages. 3,749,582, Cl. 99-48.000.

Stoneburner, George Robert: *See—*
Joyce, Ronald Stone; and Stoneburner, George Robert, 3,748,829.

Stovers, Bessie T.; and Ehnert, Richard E. Newspaper vending machine. 3,749,281, Cl. 221-2.980.

Straw, Ronald A.: *See—*
Kummer, George L., Jr.; and Straw, Ronald A., 3,748,895.

Strawn, Alvin A.: *See—*
Everitt, Scott F.; Croup, Robert E.; and Strawn, Alvin A., 3,749,198.

Strelets, Khaim Lipovich: *See—*
Kolesnikov, Anatoly Vladimirovich; Nikolaev, Mikhail Mikhailovich; Sheka, Valdimir Pavlovich; Muzhzhavlev, Konstantin Dmitrievich; Strelets, Khaim Lipovich; Kamenev, Viktor Sergeevich; Kuzmin, Valery Vyacheslavovich; Kolesnikov, Valery Afanasievich; Bashkaov, Vylacheslav Vasilievich; Baibekov, Murat Kazmukhametovich; and Kolomiitsev, Arnold Vasilievich, 3,749,660.

Strenglein, Harry F., to Sperry Rand Corporation. Vehicular safety system. 3,750,169, Cl. 343-7.0ed.

Strien, Werner; Faust, Eberhard; and Walz, Jurgen, to Keiper, Fritz KG, mesne. Mechanism for adjusting and locking the back rest of a seat. 3,749,443, Cl. 297-362.000.

Strike, Donald P.; and Smith, Herchel, to American Home Products Corporation. Tetrahydropyranyl-dihydro-PGE. 3,749,741, Cl. 260-345.700.

Stringer, George W. Dual tracer interconnecting means. 3,748,963, Cl. 90-13.00b.

Stringham, Robert R.; and Taplin, William H., III, to Dow Chemical Company, The. Alkali metal/sulfur battery having a cathodic current collector coated with molybdenum disulfide. 3,749,603, Cl. 136-6.000.

Strobl, Gustav Lorenz. Bulletproof baffle arrangement. 3,749,028, Cl. 109-58.500.

Strom, Steven S.; and Markant, Henry P., to Babcock & Wilcox Company, The. Absorption optimization. 3,749,380, Cl. 261-98.000.

Stromberg Datagraphix, Inc.: *See—*
Maxfield, Frank L.; and Trimble, Roger B., 3,749,491.

Strowger, Frances L. Foldable file for safe deposit box. 3,748,768, Cl. 40-104.030.

Subramanian, Sundaram, to Zenith Radio Corporation. Acoustic surface-wave filters and methods of manufacture therefor. 3,750,056, Cl. 333-72.000.

Sugano, Kumakichi; and Matsumura, Kenichi. Rotary kiln incinerator. 3,749,033, Cl. 110-10.000.

Sugiyama, Iwakichi; and Tomozuka, Haruki, to Matsumoto Chemical Industry Co., Ltd. Nail laquer compositions and process for the preparation thereof. 3,749,769, Cl. 424-61.000.

Sukegawa, Tomoyoshi: *See—*
Ogawa, Kiichi; Shoji, Setsuo; and Sukegawa, Tomoyoshi, 3,748,385.

Sullivan, Arthur Basil Joseph; and Houldcroft, Peter Thomas, to National Research Development Corporation. Gas assisted laser cutting apparatus. 3,749,878, Cl. 219-121.001.

Sumitomo Electric Industries, Ltd.: *See—*
Hara, Akio; and Yazu, Shuji, 3,749,656.
Shiga, Tetsuya; Inagaki, Yutaka; and Matsubara, Hironaga, 3,749,817.

Sumitomo, Yasusuke: *See—*
Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, 3,749,619.

Sumlock Anita Electronics Limited: *See—*
Foster, Eric, 3,749,872.

Summerhayes, Harry R.: *See—*
Carlson, Gerald J.; and Summerhayes, Harry R., 3,749,500.

Sumner, Paul E.: *See—*
Sumner, Paul E.; and Peter, Joseph E. (said Peter assor. to), 3,749,051.

Sumner, Paul E.; and Peter, Joseph E., said Peter assor. to Sumner, Paul E. Drapery marking apparatus. 3,749,051, Cl. 118-7.000.

Sunlite Plastics, Inc.: *See—*
Slingluff, Eugene L.; and Ostoich, Eli, 3,749,134.

Superior Electric Company: *See—*
Leenhouts, Albert C., 3,749,995.

Superseal Corporation: *See—*
Smits, Denis L., 3,748,784.

Surls, Joseph P.: *See—*
Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., 3,749,764.

Suski, Michael D.; and Suski, Michael R. Arrow nock and trigger actuated release therefor. 3,749,076, Cl. 124-31.000.

Suski, Michael R.: *See—*
Suski, Michael D.; and Suski, Michael R., 3,749,076.

Sussman, Milton H.: *See—*
Bosack, Irwin A.; and Sussman, Milton H., 3,749,481.

Sutton, Blaine M., to Smith Kline & French Laboratories, Inc. Alpha, beta-unsaturated esters of vulpinic acid. 3,749,740, Cl. 260-343.600.

Suydam, Walter, to Loftus Engineering Corporation. Walking beam furnace. 3,749,550, Cl. 432-122.000.

Suzuki, Minoru, to Kabushiki Kaisha Ricoh. Ink supply device for mimeographing machine. 3,749,009, Cl. 101-22.000.

Svensson, Stig: *See—*
Widerby, Lennart; and Svensson, Stig, 3,748,803.

Swain, William H. Method of making electret transducers. 3,748,727, Cl. 29-592.000.

Swann, Richard C. G.; and Penton, Jack I., to International Telephone and Telegraph Corporation. Production of silicon insulated gate and ion implanted field effect transistor. 3,749,610, Cl. 148-1.500.
Sweet, James B., to Dart Industries, Inc. Egg separator. 3,749,001, Cl. 99-499.000.
Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 3,749,276.
Swessel, John A., Jr., to Cutler-Hammer, Inc. Bus duct hanger assembly. 3,749,341, Cl. 248-59.000.
SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See*—
Edele, Reinhard; Bauer, Kurt; and Roth, Christian, 3,748,685.
Schmid, Eckhardt; and Kohler, Alfred, 3,749,431.
Synvar Associates: *See*—
Schneider, Richard S.; and Ullman, Edwin F., 3,749,644.
Syva Corporation: *See*—
Leute, Richard K.; and Schneider, Richard S., 3,749,645.
Syverson, Marschelle M. G.: *See*—
Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., 3,749,008.
Szabo, Josef; and Szucs, Laszlo, to Magyar Hajo-es Darugyar. Heat exchange apparatus for the utilisation of the heat content of exhaust gases. 3,749,158, Cl. 165-96.000.
Szucs, Laszlo: *See*—
Szabo, Josef; and Szucs, Laszlo, 3,749,158.
Tackman, Norbert E., to United States of America, Navy. Frequency translating repeater (boomerang) using single-sideband techniques. 3,750,173, Cl. 343-17.700.
Takagi, Tooru, to Orient Watch Co., Ltd. Water-proof wrist watch case having oval glass profile. 3,748,849, Cl. 58-90.00r.
Takahashi, Hiroaki: *See*—
Kawada, Takehiko; and Takahashi, Hiroaki, 3,749,947.
Takahashi, Kenji: *See*—
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.
Takahashi, Takeshi; Kawahara, Kenji; and Isono, Masao, to Takeda Chemical Industries, Ltd. Production of 7-amino-3-methylcephem compounds. 3,749,641, Cl. 195-29.000.
Takahashi, Takeshi; Takahashi, Toshiyuki; and Isono, Masao, to Takeda Chemical Industries, Ltd. Method for the production of aminopenicillins. 3,749,642, Cl. 195-29.000.
Takahashi, Toshiyuki: *See*—
Takahashi, Takeshi; Takahashi, Toshiyuki; and Isono, Masao, 3,749,642.
Takahata, Hisatoshi: *See*—
Yoshimura, Hirofumi; Takahata, Hisatoshi; Furuhata, Akio; and Nishimura, Susumu, 3,748,978.
Takayanagi, Shinji: *See*—
Miyauchi, Sakae; Tanaka, Kazumitsu; Takayanagi, Shinji; and Kawakami, Kenji, 3,749,821.
Takeda Chemical Industries, Ltd.: *See*—
Takahashi, Takeshi; Kawahara, Kenji; and Isono, Masao, 3,749,641.
Takahashi, Takeshi; Takahashi, Toshiyuki; and Isono, Masao, 3,749,642.
Takeda, Yoshimitsu: *See*—
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.
Takei, Haruo: *See*—
Sato, Akira; Ikeda, Tadashi; Nakazawa, Yoshiyuki; and Takei, Haruo, 3,749,714.
Takeno, Keigo; and Watanabe, Siichiro. Conveyor belt apparatus. 3,750,129, Cl. 340-267.00r.
Takeuchi, Hideo: *See*—
Asano, Hiroshi; Kikuchi, Makoto; Takeuchi, Hideo; and Kondo, Michimasa, 3,750,008.
Talandis, Vytautas P. Concrete wall form. 3,748,806, Cl. 52-426.000.
Tamagawa Kikai Kinzoku Kabushiki Kaisha: *See*—
Kazama, Toshio; and Sek, Kazunori, 3,749,522.
Tamaru, Shigeo; and Teshima, Kiyumi, to Mitsui Shipbuilding and Engineering Co., Ltd. Combined gas turbine. 3,749,047, Cl. 115-34.00r.
Tamsky, Morgan J.: *See*—
Bradshaw, Thomas Ian; and Tamsky, Morgan J., 3,748,777.
Tamura, Katsuhiko: *See*—
Fujimoto, Kyohei; and Tamura, Katsuhiko, 3,750,180.
Tamura, Toru; Kondo, Shigeru; and Hashimoto, Kozo, to Matsushita Electric Industrial Co., Ltd. Miniature delay line. 3,750,054, Cl. 333-29.000.
Tanaka, Hiromichi: *See*—
Arimura, Ichiro; Taniguchi, Hiroshi; and Tanaka, Hiromichi, 3,749,835.
Tanaka, Kazumitsu: *See*—
Miyauchi, Sakae; Tanaka, Kazumitsu; Takayanagi, Shinji; and Kawakami, Kenji, 3,749,821.
Tanaka, Yukio. Electric heater assembly. 3,749,881, Cl. 219-352.000.
Tani, Kenroku: *See*—
Mifune, Hideo; and Tani, Kenroku, 3,749,854.
Taniguchi, Hiroshi: *See*—
Arimura, Ichiro; Taniguchi, Hiroshi; and Tanaka, Hiromichi, 3,749,835.
Tanner, Emil, to Lever Brothers Company. Detergent composition. 3,749,682, Cl. 252-524.000.
Taplin, William H., III: *See*—
Stringham, Robert R.; and Taplin, William H., III, 3,749,603.
Tarabocchia, Martin, to RCA Corporation. Apparatus for and method of correcting a defective photomask. 3,748,975, Cl. 95-1.00r.
Tarrant, John, to Bofors (Great Britain) Co., Ltd. Excavator bucket with detachable side cutter. 3,748,762, Cl. 37-141.00t.
Tate, Jack F., to Texaco Inc. Secondary recovery process. 3,749,169, Cl. 166-271.000.
Tatsuno, Hiyoshi. Price register for fluid dispensing apparatus. 3,749,305, Cl. 235-94.00r.
Tausch, Gilbert H.; and Watkins, Fred E., to Camo, Incorporated. Pressure actuated safety valve. 3,749,119, Cl. 137-461.000.
Taylor, Bruce J.: *See*—
Kelch, George W.; Taylor, Bruce J.; and Welcer, Henry A., 3,749,514.
Taylor, Richard Francis, to Anglo-Transvaal Consolidated Investment Company Limited. Rock boring machine with swinging hammers and steering. 3,749,448, Cl. 299-62.000.
Taylor, Robert G.: *See*—
Cohen, Richard L.; and Taylor, Robert G., 3,749,997.
Taylor, Stanley E., to Cenco Medical/Health Supply Corporation. Suture dispenser package and method of making. 3,749,238, Cl. 206-63.300.
Taylor, Vincent J.; and Robison, Leslie P., to United States of America, Navy. Rocket launcher. 3,748,954, Cl. 89-1.807.
TCT Engineering, Inc.: *See*—
Templin, Gail H., 3,749,391.
Technical Operations, Incorporated: *See*—
Parrent, George B., Jr., 3,749,489.
Technical Research and Development Institute: *See*—
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.
Technicon Instruments Corporation: *See*—
Lsreeli, Jack; Kassel, Aaron; and Mernyk, Edwin, 3,749,113.
Technology Application Services Corporation: *See*—
Camacho, Salvador L., 3,749,802.
Camacho, Salvador L., 3,749,803.
Tecumseh Products Company: *See*—
Reese, Paul T., 3,749,069.
Teeters, Lloyd L. Fire detector and extinguisher system. 3,750,161, Cl. 340-418.000.
Teldoc Telefunken-Decca Schallplatten G.m.b.H.: *See*—
Knothe, Herbert; Roschmann, Klaus; and Rohwer, Werner, 3,749,828.
Teledyne Industries, Inc.: *See*—
Bachle, Carl F., 3,748,836.
Teman, Zale E., to GTE Automatic Electric Laboratories, Incorporated. Shielded right-angle panel mount coaxial connector. 3,750,090, Cl. 339-130.00c.
Templin, Gail H., to TCT Engineering, Inc. Adjustable fixture means for maintaining wooden truss members in proper position during fabrication of a truss. 3,749,391, Cl. 269-321.00f.
Tempmaster Corporation: *See*—
Dean, Frank J., Jr.; and Reese, James A., 3,748,997.
Terasaki, Richard M., to United States of America, Air Force. Vehicle attitude sensor. 3,749,914, Cl. 250-394.000.
Terazawa, Yoshizumi: *See*—
Ohkubo, Toshio; Ayaki, Kazuo; and Terazawa, Yoshizumi, 3,750,190.
Terramot-Beteiligungs-GmbH: *See*—
Stark, Hubert, 3,749,262.
Terrell, Ross C.; and Moore, George L., to Airco, Inc. Fluorine or chlorine-substituted 2,2-bis (trifluoromethyl) 1,3-dioxolane anesthotics. 3,749,791, Cl. 424-278.000.
Terrell, Ross C.; and Moore, George L., to Airco, Inc. Ether compounds as inhalation anesthetics. 3,749,793, Cl. 424-278.000.
Terrell, Ross C.; and Moore, George L., to Airco, Inc. Ether compounds as inhalation anesthetics. 3,749,794, Cl. 424-278.000.
Terrell, Ross C., to Airco, Inc. 1-Chloro-1-hydroperfluorobutyl difluoromethyl ether as an inhalation anesthetic. 3,749,798, Cl. 424-342.000.
Terry, Michael Peter Alwyn: *See*—
Burrows, Philip Richard Miles; Hem, Svein; and Terry, Michael Peter Alwyn, 3,749,891.
Burrows, Philip Richard Miles; Raymond, Ian McGrath; and Terry, Michael Peter Alwyn, 3,750,036.
Teshima, Kiyumi: *See*—
Tamaru, Shigeo; and Teshima, Kiyumi, 3,749,047.
Testardi, Louis Richard, to Bell Telephone Laboratories, Incorporated. Single layer superconducting memory device. 3,750,153, Cl. 340-173.100.
Tewksbury, John Merle, to Bendix Corporation, The. Single channel duplex space linked pulse communications system. 3,750,179, Cl. 343-175.000.
Texaco Inc.: *See*—
Canup, Robert E., 3,749,973.
Havlik, John J.; and Towell, Billy H., 3,750,097.
Pogonowski, Ivo C.; Carmichael, Paul D.; and Bodor, Edward E., 3,748,863.
Slater, William L.; and Robertson, Odes B., 3,749,377.
Tate, Jack F., 3,749,169.
White, William D.; and Lynch, Charles R., 3,748,894.
Texas Instruments, Incorporated: *See*—
Armstrong, James J., 3,749,879.

Bell, Antony Geoffrey, 3,749,936.
Hartmann, Clinton S., 3,750,027.
Lockerd, Robert M.; Smith, Mark W.; Cooper, Ray E.; and Goode, George E., 3,750,175.

Textron Inc.: *See—*
Covington, Cecil E.; and Puckett, Joe D., 3,749,515.
De Caro, Charles J., 3,749,146.
Liss, Donald H.; and Geiger, Gilbert W., 3,749,461.

Thatcher, Russell S., to Kelso Marine, Inc. Female die and workpiece support arrangement for a press. 3,748,890, Cl. 72-383.000.

Therm-O-Disc, Incorporated: *See—*
Gerich, Anton J., 3,748,888.

Thermo Electron Corporation: *See—*
Pezaris, Constantine D.; and Trame, Paul J., 3,748,966.

Thibert, John N. Oral implant stabilizer and denture support. 3,748,739, Cl. 32-10.00a.

Thiel, Max: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,749,724.

Thieme, Klaus-Dietrich: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.

Thiokol Chemical Corporation: *See—*
Dorsey, Edward G., Jr.; Peterson, John A.; and Lund, Robert K., 3,749,615.
Krackenberger, Herman F.; and Smith, Daniel J., 3,749,616.

Thiry, William G., to Wagner Electric Corporation. Vehicle headlamp shield. 3,749,906, Cl. 240-46.010.

Thomas, Daniel Walter; and Giambalvo, Vito Albert, to American Cyanamid Company. Amine treatment of sulfonated phthalocyanines. 3,749,590, Cl. 106-288.00q.

Thomas, Edward W.; and Rapkin, Edward, to Intertechnique S.A. Program selection drive for use in programing automatic scintillation spectrometry. 3,749,916, Cl. 250-271.000.

Thomas, Johann, to Siemens Aktiengesellschaft. Method for determining the depth of immersion of electrodes in a reduction furnace. 3,749,804, Cl. 13-13.000.

Thomas-CSF: *See—*
Funck, Ronald, 3,750,055.

Thompson, Raymond: *See—*
Stibbs, Donald; Brown, Clifford Gordon; and Thompson, Raymond, 3,749,571.

Thompson, Stanley P. Crop dehydrator and method. 3,749,382, Cl. 432-58.000.

Thompson, Tommy Lewis, to Life Support, Inc. Rate stabilizers for chemical oxygen generators. 3,749,678, Cl. 252-187.00r.

Thomson-CSF: *See—*
Drabowitch, Serge, 3,750,183.
Epsztein, Bernard, 3,750,043.

Thorington, Luke: *See—*
Emidy, Thomas J.; Northrop, Donald P.; Thorington, Luke; and Olsen, Andrew Henry, 3,749,467.

Thylefors, Henric Wilhelm, to Alfa-Laval AB. Centering device for rotary shaft. 3,749,458, Cl. 308-142.000.

Tiazkun, Michael George; and Loose, Winfield Warren, to AMP Incorporated. Foam seat sensor. 3,749,866, Cl. 200-85.00a.

Tica Industries, Limited: *See—*
Holohan, Bartholomew A., 3,748,734.

Tice, Charles, to Delaval Turbine Inc. Fluid condition responsive switch unit. 3,749,864, Cl. 200-81.90m.

Tikhonovsky, Alexel Lavrentievich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Tillman, Cassius, III. Pipe joint seal. 3,749,426, Cl. 285-336.000.

Timm, Roderick G. Work handling mechanism for sewing apparatus. 3,749,397, Cl. 271-70.000.

Timson, William J., to Polaroid Corporation. Coating apparatus. 3,749,053, Cl. 118-50.000.

Tindale, John Basil; and Burgess, James Henry, to United Kingdom Atomic Energy Authority. Apparatus for inserting rods into a frame. 3,748,713, Cl. 29-200.00p.

Tiraspolsky, Wladimir; and Rouviere, Roger Francois. Device for regulating the feed flow of a hydraulic rotary machine. 3,749,185, Cl. 175-26.000.

Titanium Processors Incorporated: *See—*
Augustine, Lewis Edwin, 3,749,613.

Tittle, Harry D., to Hughes Aircraft Company. Encapsulated packaged electronic assembly. 3,749,601, Cl. 117-218.000.

Todd, Harold E.: *See—*
Fuqua, Lloyd T.; and Todd, Harold E., 3,749,960.

Todish, W. Donald: *See—*
Jago, Edward John; Eastwood, Fred; and Todish, W. Donald, 3,749,148.

Toepfl, Werner, to Ciba-Geigy AG. Microficidal and germicidal compositions containing -N-halophenyldichloroisothiazolones. 3,749,788, Cl. 424-270.000.

Togashi, Syozo: *See—*
Sato, Yoshimasa; and Togashi, Syozo, 3,749,622.

Tohoku Metal Industries, Limited: *See—*
Kato, Umaki; Endo, Masanori; and Kamata, Katsuo, 3,750,064.

Tokico, Ltd.: *See—*
Irie, Yoshihiko; Kato, Mahiko; and Gomi, Kiyondo, 3,748,903.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Fujita, Atsushi; and Uchida, Teruhiko, 3,749,398.
Kuniyoshi, Masateru, 3,749,991.
Miyashiro, Shoichi; Ogawa, Kazuyuki; and Hori, Hiroo, 3,749,969.
Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, 3,749,619.
Yagi, Motoi; and Kawamura, Yoshihisa, 3,749,850.

Tomalia, Donald A.; and Paige, Janet N., to Dow Chemical Company, The. Bi-2-oxazoline and oxazine ethers and thioethers. 3,749,683, Cl. 260-2.00n.

Tomasi, Sergio: *See—*
Fornasiero, Paolo; and Tomasi, Sergio, 3,749,839.
Fornasiero, Paolo; and Tomasi, Sergio, 3,749,840.

Tomioka, Hiroyuki, to Shinko Wire Co., Ltd. Method of anchoring wires and strands in prestressed concrete. 3,748,723, Cl. 29-517.000.

Tomozuka, Haruki: *See—*
Sugiyama, Iwakichi; and Tomozuka, Haruki, 3,749,769.

Tompkins, Melvin W.; and Retz, George F., to American Standard Inc. Intersection construction for movable wall panel system. 3,748,793, Cl. 52-64.000.

Tontini, Remo, to Rohr Industries, Inc. Sound suppressing thrust augmenting apparatus. 3,749,316, Cl. 239-265.130.

Topilin, Valentin Vasilievich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.

Toshiba Kikai Kabushiki Kaisha: *See—*
Ashizawa, Yoshimi; and Kitagima, Isao, 3,748,883.

Tough, William J.; and Hintsa, Roy A., to Rule, A. E., (1965) Limited. Sound-absorbent panel. 3,748,799, Cl. 52-144.000.

Towell, Billy H.: *See—*
Havlik, John J.; and Towell, Billy H., 3,750,097.

Toyama, Chiyoko. Panties with pad retainer. 3,749,095, Cl. 128-288.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Abe, Jinnosuke; Miyauchi, Kango; and Kanoh, Masatoshi, 3,749,580.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yojiro; Uemura, Masaru; and Fujiki, Tokio, 3,749,756.

Toyoda Koki Kabushiki Kaisha: *See—*
Wada, Ryuji; and Kanou, Kimio, 3,748,789.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Uozumi, Sumio; and Arai, Hiroshi, 3,748,856.

Trame, Paul J.: *See—*
Pezaris, Constantine D.; and Trame, Paul J., 3,748,966.

Tranquillitsky, George V. Cell structure of interconnected polyhedrons in panels, beams and other structural components. 3,749,636, Cl. 161-37.000.

Traylor, Charles O., to Hutchens & Sons Metal Products, Inc. Axle attachment device. 3,749,196, Cl. 180-85.000.

Treber, Andrew S.: *See—*
Powell, James C.; and Treber, Andrew S., 3,748,674.

Trenbeath, Richard E.: *See—*
Hiklert, Thomas L.; Fransson, Goran E.; and Trenbeath, Richard E., 3,748,962.

Trent, Edward J.: *See—*
Kagele, Frank L.; Meyers, Lavern H.; and Trent, Edward J., 3,749,007.

Tresselt, Carl P., to Bendix Corporation, The. Multifrequency CW radar with range cutoff. 3,750,172, Cl. 343-12.00r.

Trimble, Roger B.: *See—*
Maxfield, Frank L.; and Trimble, Roger B., 3,749,491.

Troster, Helmut: *See—*
Fuchs, Otto; and Troster, Helmut, 3,749,727.

Trunk, Eugene John: *See—*
Feinstein, Sumner Sheldon; Golner, Jerold Julius; D'Amato, Salvatore; and Trunk, Eugene John, 3,748,939.

Trusov, Alexandr Alexandrovich: *See—*
Kutozov, Boris Nikplaevich; Mikheev, Igor Grigorievich; Grigoriev, Vladimir Konntantinovich; Chugunov, Viktor Dmitrievich; Nakinsky, Isaak Emmanuilovich; Trusov, Alexandr Alexandrovich; Sharonoy, Georgy Ivanovich; and Golosov, Viktor Fedorovich, 3,749,186.

TRW Inc.: *See—*
Alexander, John A., 3,748,721.
Bochory, Michael, 3,749,133.
Vetter, Ottomar H., 3,750,087.

Tryzna, Charles J.; and Krantz, Quentin R., to Metalectric, Inc. Process of electrolytic etching. 3,749,653, Cl. 204-129.400.

Tschischke, Werner: *See—*
Ludwig, Frank; Bannehr, Konrad; Rothe, Dieter; and Tschischke, Werner, 3,748,871.

Tsuruoka, Kanzi: *See—*
Matsuzaki, Akio; Tsuruoka, Kanzi; Sada, Tetuo; and Onishi, Hiroshi, 3,749,241.

Tsutsumi, Hiroshi: *See—*
Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, 3,749,619.

Tubis, Manuel: *See—*
Halpern, Samuel E.; Tubis, Manuel; and Endow, John S., 3,749,913.
Tyburski, Robert M.: *See—*
Holdway, John B.; and Tyburski, Robert M., 3,749,239.
Tyco Laboratories, Inc.: *See—*
Jasinski, Raymond J.; and Gaines, Lewis H., 3,749,607.
Tyler, Tommy N.: *See—*
Webb, Richard C.; Webb, James R.; and Tyler, Tommy N., 3,749,859.
Uchida, Kosaku, to Matsushita Electric Industrial Co., Ltd. Tuning system. 3,750,028, Cl. 325-418.000.
Uchida, Teruhiko: *See—*
Fujita, Atsushi; and Uchida, Teruhiko, 3,749,398.
Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. System for sensing collision of motor vehicles. 3,750,100, Cl. 340-52.00h.
Uemura, Masaru: *See—*
Kosaka, Yojiro; Uemura, Masaru; and Fujiki, Tokio, 3,749,756.
Ullman, Edwin F.: *See—*
Schneider, Richard S.; and Ullman, Edwin F., 3,749,644.
Underwood, James H.: *See—*
Hoover, Richard B.; and Underwood, James H., 3,749,911.
Ungerer, Irma: *See—*
Munchbach, Curt, 3,748,938.
Ungerman, Warren J., to Captain International Industries, Ltd. Apparatus for dispensing articles and registering charges therefor. 3,749,279, Cl. 221-7.000.
Union Oil Company of California: *See—*
Fischer, Paul W.; Maly, George P.; and Pyle, Delbert E., 3,749,554.
Mickelson, Grant A., 3,749,663.
Mickelson, Grant A., 3,749,664.
Union Special Machine Company: *See—*
Bowin, Richard E., 3,749,041.
Union Special Maschinenfabrik G.m.b.H.: *See—*
Jurgens, Erwin, 3,749,040.
United Aircraft Corporation: *See—*
Alver, Alf S.; and Pilpel, Walter, 3,749,518.
Galli, Charles, 3,749,517.
Kegelman, Thomas D., 3,749,919.
Kelch, George W.; Taylor, Bruce J.; and Welcer, Henry A., 3,749,514.
Mikulski, Walter E., 3,749,654.
Whitney, Herbert A., 3,748,964.
United Aircraft Products, Inc.: *See—*
Fernandes, Joseph F.; Pfouts, Robert R.; and Lord, Thomas J., 3,749,308.
United Filtration Corporation: *See—*
Kleinhenn, Walter H., 3,749,080.
United Kingdom Atomic Energy Authority: *See—*
Tindale, John Basil; and Burgess, James Henry, 3,748,713.
Ward, Geoffrey Marcus, 3,749,958.
United Nuclear Corporation: *See—*
Israel, Sanford L., 3,749,640.
United States Borax & Chemical Corporation: *See—*
Cromwell, Thomas M.; and Sprague, Robert W., 3,749,792.
Stibbs, Donald; Brown, Clifford Gordon; and Thompson, Raymond, 3,749,571.
United States Elevator Corporation: *See—*
Hoelscher, William R., 3,749,203.
United States o America, National Aeronautics and Space Administration: *See—*
Gray, Vernon H., 3,749,332.
United States of America
Agriculture: *See—*
Cruse, Robert R.; and Lime, Bruce J., 3,749,585.
Koenig, Nathan H.; and Friedman, Mendel, 3,749,553.
Koritala, Sambasivarao, 3,749,681.
Kurtzman, Ralph H., Jr.; and Schwimmer, Sigmund, 3,749,584.
Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., 3,749,669.
Rowland, Stanley P., 3,749,552.
Air Force: *See—*
Frederickson, Arthur R.; Morris, Arnold D.; and Jackson, B. Walter, 3,749,963.
Hershkowitz, Joseph, 3,749,016.
Kernweis, Nicholas P., 3,750,182.
Lindberg, Charles W., 3,749,022.
Ludman, Jacques E., 3,750,048.
McKendree, Jesse R., Jr.; and Koenig, John R., 3,748,892.
Rotman, Walter; and Karas, Nicholas V., 3,750,013.
Terasaki, Richard M., 3,749,914.
Wilcox, Jack E., 3,750,148.
Army: *See—*
Downes, George R., Jr.; Brewer, Stanley F.; and Murtha, James E., 3,750,005.
Klein, Theodore J., 3,750,145.
McCorkle, William C., Jr., 3,749,334.
Atomic Energy Commission: *See—*
Anger, Hal O., 3,748,992.
Gilson, Verle A., 3,750,047.
Hagood, Jerry W.; and Shelton, Joe, 3,749,915.
Health, Education and Welfare: *See—*
Bowman, Ronald R.; Larsen, Ezra B.; and Belsher, Donald R., 3,750,017.
National Aeronautics and Space Administration: *See—*
Hoover, Richard B.; and Underwood, James H., 3,749,911.
Jones, Robert E.; and Niedzwiecki, Richard W., 3,748,853.
Moore, Thomas J., 3,748,722.
O'Connor, Joseph W.; and Orem, Victor C., 3,749,362.
Schrader, James H.; and Couch, Richard H., 3,750,168.
Simpkins, Lorenz G., 3,749,831.
National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Eby, Robert J.; and Powers, Edward I. Thermal control system for a space-craft modular housing. 3,749,156, Cl. 165-32.000.
Fay, Richard J.; and Wittrock, Edward P. Metal shearing energy absorber. 3,749,205, Cl. 188-1.00c.
Oakley, Ernest C. RF-source resistance meters. 3,750,016, Cl. 324-57.00r.
Read, William S.; and Roberts, Vasel W. Silent emergency alarm system for schools and the like. 3,750,131, Cl. 340-277.000.
Sabelman, Eric E. Ferrofluidic solenoid. 3,750,067, Cl. 335-296.000.
Whitten, David E. Dual stage check valve. 3,749,123, Cl. 137-316.270.
Zahlava, Bruce A. Vacuum probe surface sampler. 3,748,905, Cl. 73-421.50r.
Navy: *See—*
Breglia, Denis R.; Rodemann, Alfred H.; and Mohon, Windell N., 3,748,751.
Ford, Richard T., 3,748,904.
Gregg, Michael C.; and Cox, Charles S., 3,748,899.
Hecker, Klaus J., 3,750,163.
Pakulak, Jack M., Jr., 3,749,024.
Peterson, Carl R., 3,749,017.
Smith, Richard Miles, 3,750,109.
Smith, Sidney T.; and Winslow, Lester M., 3,749,962.
Tackman, Norbert E., 3,750,173.
Taylor, Vincent J.; and Robison, Leslie P., 3,748,954.
Weir, James D., 3,750,040.
Navy, mesne: *See—*
Belluck, Raymond E., 3,750,174.
Veterans Administration: *See—*
Halpern, Samuel E.; Tubis, Manuel; and Endow, John S., 3,749,913.
United States Pipe and Foundry Company: *See—*
Anderson, Malcolm W., 3,748,673.
United States Steel Corporation: *See—*
Andrzejak, Sigmund L.; and Berg, Raymond B., 3,749,387.
Bird, James E.; and Carter, Paul R., 3,749,651.
Mihelic, Edward L.; and Morgan, Marcus S., 3,749,688.
Rudolph, Ralph G., 3,749,979.
Warren, Loyal D., 3,749,935.
Universal Oil Products Company: *See—*
Pollitzer, Ernest L.; and Mitsche, Roy T., 3,749,752.
University of Akton, The: *See—*
Cardarelli, Nathan F.; and Mansdorf, Seymour Zachary, 3,749,772.
University of California, The Regents of the: *See—*
Hegeman, George D.; and Ellman, George L., 3,749,643.
Karplus, Robert; Montgomery, Marshall A.; and Berger, Carl F., 3,748,755.
Unterstenhofer, Gunter: *See—*
Fest, Christa; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,749,720.
Uozumi, Sumio; and Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmission. 3,748,856, Cl. 60-357.000.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 3,749,733.
Stehle, Randall G.; and Oesterling, Thomas O., 3,749,800.
Upmeier, Hartmut, to Windmoller & Holscher. Apparatus for air-cooling a tubular plastics film blown by a blowhead. 3,749,540, Cl. 425-326.000.
Urquhart, Thomas N.: *See—*
Koltuniak, Michael A.; Urquhart, Thomas N.; and Case, Leo L., 3,749,981.
U.S. Philips Corporation: *See—*
Baars, Nicolaas Joris, 3,750,029.
Elzinga, Johannes Mattheus, 3,750,160.
Kuijk, Karel Elbert; and Hagenbeuk, Henk, 3,749,939.
Kuiken, Hendrik; and Bergsma, Wytse, 3,748,731.
Meijeb, Roelf Jan, 3,749,159.
U.S. Philips Corporation, mesne: *See—*
Van Der Aa, Herman Henricus Maria, 3,748,970.
Usui, Keizaburo; Mitsuashi, Ken Ichi; and Yamaguchi, Michio, to Nissan Motor Company, Limited. Vehicular safety device. 3,749,419, Cl. 280-150.0ab.
Usui, Yukio: *See—*
Moriya, Shozo; Ohta, Shoji; Iwawaki, Yasutaka; and Usui, Yukio, 3,749,852.
Vail, Robert E.: *See—*
Boehringer, Raymond H.; and Vail, Robert E., 3,749,702.
Valassis, John G., to GTE Automatic Electric Laboratories, Incorporated. Charge coupled electronic line scanner. 3,750,114, Cl. 340-173.01s.
Valayil, Silvester P., to M & T Chemicals, Inc. Bright tin-lead alloy plating. 3,749,649, Cl. 204-43.00s.

Valek, Robert J.: *See—*
Hietanen, Edwin D.; and Valek, Robert J., 3,749,496.

Valentino, Joseph V. Opener for clam shells and the like. 3,748,692, Cl. 17-76.000.

Van Der Aa, Herman Henricus Maria, to U.S. Philips Corporation, mesne. Device with rolling diaphragm seal separating gas and liquid. 3,748,970, Cl. 92-83.000.

Van Der Veer, Frank Willard; and Nolan, Barry Allaire. Animation method and apparatus. 3,749,822, Cl. 178-5.200.

Van Gompel, James J., to Brammall, Inc. Primary opening apparatus. 3,749,365, Cl. 254-104.000.

van Osten, Philip G.: *See—*
Rosenfeld, Jacob R.; and van Osten, Philip G., 3,749,109.

Van Winkler, Vernon. Capacitance function generator. 3,749,938, Cl. 307-227.000.

Vanslette, Robert A.: *See—*
Karas, Edwin L.; Lee, Davis S.; and Vanslette, Robert A., 3,748,833.

Varano, Dominick J.: *See—*
George, Michael D.; Varano, Dominick J.; Bronson, George K.; Kitchin, Nelson L.; and Rose, William W., Jr., 3,749,151.

Vargiu, Silvio; Passalenti, Beppino; and Abruzzi, Pierluigi, to Societa' Italiana Resine S.p.A. Polyester composition and method of manufacturing the same. 3,749,689, Cl. 260-29.6nr.

Varnin, Valentin Pavlovich: *See—*
Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Fedossey, Dmitry Valerianovich; Nikitin, Jury Ivanovich; Bochko, Anatoly Vasilievich; Ryabov, Vadim Alexandrovich; and Varnin, Valentin Pavlovich, 3,749,760.

Vasilenko, Evstafy Andreevich: *See—*
Khodosh, Vladimir Alexandrovich; Salov, Sergei Fedorovich; Alexandrovich, Valentin; Mozhaev, Arkady Ivanovich; Vasilenko, Evstafy Andreevich; Pachulia, Budu Pavlovich; Eishman, Iosif David-Yankelevich; Melnikov, Ivan Iosifovich; and Rusanov, Faust Ivanovic, 3,749,352.

Vaskunas, Vygantas A.; and Hager, Howard K., to Interface Industries, Inc. Reader apparatus for reading record materials at speeds which are independent of recording speeds. 3,749,889, Cl. 235-61.110.

Vddeholms Aktibolag: *See—*
Kylberg, Bengt J.; and Wold, Lars Espen, 3,749,568.

VEB Wirkmaschinenbau Karl-Marx-Stadt: *See—*
Ludwig, Frank; Bannehr, Konrad; Rothe, Dieter; and Tschischke, Werner, 3,748,871.

Vedova, Ralph, to Motoren- und Turbinen-Union Munchen GmbH. Lift engine. 3,748,854, Cl. 60-226.00r.

Veeder Industries, Inc.: *See—*
Gray, Paul E., 3,750,140.
Nelson, Howard W., 3,749,283.

Vegners, Edgar Z., to Eaton Corporation. Hydrostatic drive transmission assembly. 3,749,195, Cl. 180-66.00f.

Velco-Bind, Inc.: *See—*
Abildgaard, William H.; and Groswith, Charles T., III, 3,749,422.
Abildgaard, William H.; and Groswith, Charles T., III, 3,749,423.

Velcro S.A.: *See—*
De Mestral, George, 3,748,701.

Velkoff, Henry R., to Ohio State University, The. Apparatus and method for controlling liquid fuel sprays for combustion. 3,749,545, Cl. 431-2.000.

Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Mayer, David P., 3,749,796.

Vely, Victor G.: *See—*
Litchfield, John H.; and Vely, Victor G., 3,749,766.

Venus, Willisbald, to Gusstahlwerk Wittmann AG. Apparatus for controlling the pressure at the input of casting machines. 3,748,858, Cl. 60-413.000.

Vepa AG: *See—*
Fleissner, Heinz, 3,748,747.

Verbeke, Henry, to APL Corporation. Bag vending machine. 3,749,218, Cl. 194-2.000.

Verderio, Giuseppe. Built-up rail post by which the steps of spiral stairs are connected with the hand rail, and components of such rail post. 3,748,802, Cl. 52-187.000.

Verlinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft: *See—*
Werner, Hans, 3,749,384.

Verrien, Jean Prudent Fernand Rene: *See—*
Marchal, Philippe Albert Hippolyte; Simonnet, Jacques Louis Paul; Mordchelles Regnier, Georges; and Verrien, Jean Prudent Fernand Rene, 3,748,826.

Versteeg, Gijsbert, to Imex A.G. Process for the production of reinforcement. 3,748,720, Cl. 29-471.300.

Vetter, Ottomar H., to TRW Inc. Preloaded electrical connector. 3,750,087, Cl. 339-90.00r.

Vic Chemicals, Inc.: *See—*
Alm, Gerald F.; Alm, Donald S.; Harvey, Ralph R.; Harvey, Robert L.; Andrews, Ray L.; and Lewis, Keith B., 3,749,376.

Victor Company of Japan, Ltd.: *See—*
Kinjo, Hisao; and Akuwa, Fumio, 3,749,827.

Vidjak, Frank V., to Star-Kist Foods, Inc. Cooking tray set. 3,749,000, Cl. 99-425.000.

Viemeister, Peter E. Behavior simulator. 3,748,750, Cl. 35-22.00r.

Viessmann, Hans. Swimming pool. 3,748,665, Cl. 4-172.190.

Villerog & Boch Keramische Werke AG: *See—*
von Boch Galhau, Marie Helene Isabella Antonia, 3,749,278.

Vischulis, George. Target position detecting device having means to adjust response of photocells. 3,749,924, Cl. 250-227.00r.

Vital, Zoltan; and Orban, Jean, to Ponder & Best, Inc., mesne. Control of electronically generated light pulses. 3,749,921, Cl. 250-214.00p.

Vitzthum, Otto: *See—*
Lehmann, Gunter; Neunhoeffer, Otto; Roselius, Wilhelm; and Vitzthum, Otto, 3,749,698.

Vodvarka, Richard T.; and Kozbelt, Lloyd S., to Emerson Electric Co. Electric heater assembly. 3,749,883, Cl. 219-463.000.

Voigt, Edward Harold; and Hall, William Bernard, to RCA Corporation. Apparatus for processing semiconductor devices. 3,749,383, Cl. 266-5.00a.

Voith Getriebe KG: *See—*
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, 3,749,209.

Volkheimer, Lothar: *See—*
Mayer, Rudolf; Sakautzki, Hans; and Volkheimer, Lothar, 3,750,031.

von Boch Galhau, Marie Helene Isabella Antonia, to Villerog & Boch Keramische Werke AG. Set of different dinner-ware articles. 3,749,278, Cl. 220-23.830.

Von Der Mosel, Hans A., to Bio-Controls Corporation. Suppository electrode structure. 3,749,100, Cl. 128-407.000.

Von Hoevel, Edmund H.; and Bolte, Robert A., to Hanlon & Wilson Company. Exhaust system for a diesel engine. 3,748,850, Cl. 60-13.000.

Von Ruti, Jurg. Electrical circuit for the transferring and amplification of a piezoelectric transducer signal. 3,749,946, Cl. 310-8.100.

Voss, Josef, KG, Firma: *See—*
Wolter, Heinz, 3,748,877.

Vossen, John Louis, Jr., to RCA Corporation. Method of fabricating transparent conductors. 3,749,658, Cl. 204-192.000.

Vrancken, Marcel Nicolas; and Willens, Jozef Frans, to Gevaert Photo-Production N.V. Preparation of new protein derivatives by reacting gelatin with aromatic compounds containing stilbene or diphenylimidazolene. 3,749,707, Cl. 260-117.000.

Vyzkumny ustav pletarsky: *See—*
Slof, Alius; and Smejkal, Vladimir, 3,748,875.

Wabnitz, Herbert E., Jr.: *See—*
Willis, Roland G.; and Wabnitz, Herbert E., Jr., 3,749,572.

Wada, Ryuji; and Kanou, Kimio, to Toyoda Koki Kabushiki Kaisha. Grinding machine. 3,748,789, Cl. 51-165.800.

Wada, Yasuhiro, to Kabushiki Kaisha Koparu. Electronic shutter apparatus for cameras. 3,748,979, Cl. 95-10.0ct.

Wade, Charles H., to Whirlpool Corporation. Liquid dispenser. 3,749,288, Cl. 222-187.000.

Waful, Lawrence F., to General Electric Company. Pulse-echo phase discriminator using deltic processing. 3,750,152, Cl. 340-3.00r.

Wagner, Arthur E. Trolling board. 3,748,775, Cl. 43-43.130.

Wagner Electric Corporation: *See—*
Thiry, William G., 3,749,906.

Wagner, Jakob. Circular pen for brook sow with piglets. 3,749,060, Cl. 119-16.000.

Waldvogel, Erwin: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,749,786.

Walker, Frank H.; and Kantrud, Gary M., to General Motors Corporation. Reversible fluid unit. 3,749,531, Cl. 418-45.000.

Walker, Loren H., to ESB Incorporated. Instantaneous current control for static inverters. 3,750,004, Cl. 321-14.000.

Walker, Robert Winn, to Rohm and Haas Company. Water purification with amine oxide resins. 3,749,668, Cl. 210-37.000.

Walker, Robert Winn. Resins with tertiary amine oxide functionality. 3,749,684, Cl. 260-2.10e.

Walters, John P., to Wisconsin Alumni Research Foundation. Adjustable waveform spark source. 3,749,975, Cl. 315-241.00r.

Walther, Carl, Sportwaffenfabrik: *See—*
Hobner, Siegfried, 3,748,956.

Walz, Jurgen: *See—*
Strien, Werner; Faust, Eberhard; and Walz, Jurgen, 3,749,443.

Wang, Jish-Min: *See—*
Chen, Arthur C. M.; and Wang, Jish-Min, 3,750,117.

Wang, Teh Po: *See—*
Starr, Carrol Dean; Steinitz, Robert; and Wang, Teh Po, 3,749,569.

Wansa, Peter. Cigarette snuffing device. 3,749,104, Cl. 131-256.000.

Ward, Geoffrey Marcus, to United Kingdom Atomic Energy Authority. Electrohydraulic crushing apparatus. 3,749,958, Cl. 313-146.000.

Ward, Thomas V., to Caterpillar Tractor Co. Swash plate gas compressor. 3,749,523, Cl. 417-269.000.

Warner, Dwight Allen, to Daedalus Enterprises, Inc. Signal processing circuit. 3,749,823, Cl. 178-5.40r.

Warner, Frederick L. Lightweight body supporting structure. 3,748,669, Cl. 5-348.0wb.

Warner-Lambert Company: *See—*
Ninger, Fred C.; and Eichman, Martin L., 3,749,773.
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,749,731.

Warner-Lambert Pharmaceutical Company: *See—*
Herrmann, Wolfgang; and Satzinger, Gerhard, 3,749,721.

Warren, Allyn G.; and Warren, Douglas S. Golf club and ball wash rack. 3,748,676, Cl. 15-21.00a.

Warren, Douglas S.: *See—*
Warren, Allyn G.; and Warren, Douglas S., 3,748,676.

Warren, F. J., Limited: *See—*
Mallard, John, 3,749,471.
Warren, Loyal D., to United States Steel Corporation. Variable speed bi-directional control mechanism. 3,749,935, Cl. 307-149.000.
Waso Limited: *See—*
Atkins, Barry Keith, 3,748,880.
Wasteco, Inc.: *See—*
Burden, Roy B., Jr.; and O'Gieblyn, Erjest J., 3,749,030.
Burden, Roy B., Jr., 3,749,031.
Watanabe, Kazuhisa, to Nippon Telegraph and Telephone Public Corporation. Intersymbol interference component eliminating system. 3,750,026, Cl. 325-321.000.
Watanabe, Siichiro: *See—*
Takeno, Keigo; and Watanabe, Siichiro, 3,750,129.
Waters, Elmer D., to McDonnell Douglas Corporation. Oil well permafrost stabilization system. 3,749,163, Cl. 166-57.000.
Watkins, Fred E.: *See—*
Tausch, Gilbert H.; and Watkins, Fred E., 3,749,119.
Watkins-Johnson Company: *See—*
Bates, David J.; Silzars, Ariz; Roberts, Lester A.; and Long, James A., 3,749,961.
Watson, Clyde D.: *See—*
Abbott, John A.; and Watson, Clyde D., 3,749,103.
Watson, James H. P., to Corning Glass Works. Method of making granular superconductors. 3,748,728, Cl. 29-599.000.
Watts, Glen A. Two way gang plow with variable number bottoms. 3,749,178, Cl. 172-225.000.
Weatherford Oil Tool Company, Inc.: *See—*
Hall, John A., Sr., 3,749,168.
Webb, James R.: *See—*
Webb, Richard C.; Webb, James R.; and Tyler, Tommy N., 3,749,859.
Webb, Richard C.; Webb, James R.; and Tyler, Tommy N., to Colorado Instruments, Inc. Keyboard switch assembly with improved hermetically sealed diaphragm contact structure. 3,749,859, Cl. 200-5.00r.
Weber, John Herbert: *See—*
Benjamin, John Stanwood; Cairns, Robert Lacock; and Weber, John Herbert, 3,749,612.
Weber, Julius, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Exhaust gas muffler for internal combustion engines of vehicles. 3,749,199, Cl. 181-38.000.
Weers, Uwe: *See—*
Gatermann, Willi; Sorgel, Rolf; Mudder, Hinderk; Thieme, Klaus-Dietrich; Sedlacek, Herbert; Weers, Uwe; and Hermes, Heinz, 3,748,955.
Weghaupt, Erich: *See—*
Lambrecht, Dietrich; and Weghaupt, Erich, 3,749,952.
Wehle, Volker: *See—*
Freyhold, Helmut V.; and Wehle, Volker, 3,749,759.
Weigert, Wolfgang: *See—*
Schwarze, Werner; and Weigert, Wolfgang, 3,749,565.
Weiner, Norbert. Apparatus for insulating adjacent coils in an electrical coil former. 3,750,072, Cl. 336-185.000.
Weinrich, Hellmut; Peltner, Johannes; Helfer, Friedrich; Dick, Heinrich; and Haeberle, Fritz, to Voith Getriebe KG. Hydrodynamic braking system for applying an impact-free braking torque to a rotating member. 3,749,209, Cl. 188-291.000.
Weinstein, Howard; and Carenza, Edward C. Apparatus for bathing dogs. 3,749,064, Cl. 119-158.000.
Weir, George R.: *See—*
Adickes, Cecil F.; Beaubien, Thomas S.; Weir, George R.; and Echterling, Eugene J., 3,749,402.
Weir, James D., to United States of America, Navy. Transistor delay line driver. 3,750,040, Cl. 330-24.000.
Weisend, Burke A., to Package Machinery Company. Plastic injection modling machine monitor. 3,750,134, Cl. 340-324.00a.
Weissenborn, Dieter; Bock, Ortwin; and Werding, Norbert, to Friemann & Wolf GmbH. Visual and RF beacon for miners hat with control circuit. 3,750,023, Cl. 325-105.000.
Weitmann & Conrad: *See—*
Weitmann, Heinz, 3,749,313.
Weitmann, Heinz, to Weitmann & Conrad. Device for moistening moving surfaces 56 239/127.000. 3,749,313, Cl. .
Welcer, Henry A.: *See—*
Keich, George W.; Taylor, Bruce J.; and Welcer, Henry A., 3,749,514.
Wells Manufacturing Corporation: *See—*
Alexander, Carl J., 3,748,738.
Welzel, Josef, to Hemscheidt, Hermann, Maschinenfabrik. Roof support frame. 3,748,862, Cl. 61-45.00d.
Wendel, Gunther, to SKF Kugellagerfabriken Gesellschaft mit beschrankter Haftung. Spindle collar storage for spindles of spinning and thread machines. 3,749,462, Cl. 308-228.000.
Wentworth, Hobart L.: *See—*
Seelnadt, Karl H.; and Wentworth, Hobart L., 3,749,805.
Wentworth, Milo R.: *See—*
Mott, Richard C.; and Wentworth, Milo R., 3,749,306.
Wentworth, Richard G.: *See—*
Burgan, Paul G.; and Jekiel, Richard J., 3,750,138.
Werding, Norbert: *See—*
Weissenborn, Dieter; Bock, Ortwin; and Werding, Norbert, 3,750,023.
Werkzeugbau GmbH: *See—*
Boehm, Otto, 3,749,189.
Werkzeugmaschinenfabrik Oerlikon-Buhrle A.G.: *See—*
Weyhmuller, Rolf, 3,749,020.
Werner & Pfleiderer: *See—*
Buchheit, Dieter, 3,749,374.
Hermann, Heinz; and Ocker, Herbert, 3,749,375.
Werner, Hans, to Verlinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Process and apparatus for quenching without distorting rotation-symmetrical work pieces heated to a hardening temperature. 3,749,384, Cl. 266-6.0pc.
Wernick, Jack Harry: *See—*
Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,750,046.
West, Ben F.: *See—*
Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., 3,749,764.
West Creek Co., Inc.: *See—*
Ehrlichmann, Merlin W.; and Bjorklund, John R., Jr., 3,749,032.
West, James Edward: *See—*
Sessler, Gerhard Martin; West, James Edward; and Hirsch, Alfred E., Jr., 3,750,149.
Western Electric Company, Inc.: *See—*
Blitchington, Frank H., Jr., 3,749,830.
Western Electric Company, Incorporated: *See—*
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., 3,748,677.
Weste2 Electric Company, Incorporated: *See—*
Avedissian, Michael K., 3,749,339.
Westinghouse Air Brake Company: *See—*
Wilson, Richard L.; and Worbois, Robert J., 3,749,453.
Westinghouse Electric Corporation: *See—*
Caputo, William R., 3,749,204.
Davies, Norman, 3,749,861.
Eley, Edgar R., 3,750,071.
Evans, Gary E., 3,750,185.
Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., 3,749,604.
Luebrecht, Richard E., 3,749,944.
Matty, Thomas C., 3,749,994.
Patel, Nagar J.; and Siviy, George, 3,750,059.
Pittner, John R., 3,749,989.
Pittner, John Richard, 3,749,988.
Rexroad, James O., 3,749,867.
Rissinger, John C., 3,750,070.
Wilson, John R.; and Shariff, Sadig A., 3,749,862.
Weston Instruments, Inc.: *See—*
Munt, Irwin, 3,749,896.
Weston, Steven S.: *See—*
Krueger, Robert K.; Bayne, Peter D.; and Weston, Steven S., 3,749,795.
Weyhmuller, Rolf, to Werkzeugmaschinenfabrik Oerlikon-Buhrle A.G. Cartridge and a method of producing the same. 3,749,020, Cl. 102-38.000.
Wheatley, Roger W.: *See—*
Boetller, Albert J.; Clarke, Allan M.; and Wheatley, Roger W., 3,749,648.
Whirlpool Corporation: *See—*
Robandt, William F., II, 3,748,746.
Wade, Charles H., 3,749,288.
Whitaker, William D. Fluid lubricated bearing and pressure sensing control valve. 3,749,456, Cl. 308-9.000.
Whitcomb, Elmer W.; and Raba, Joseph W. Electro-optic device for improving reading ability. 3,748,753, Cl. 35-35.00b.
White, John W. Mailbox construction. 3,749,302, Cl. 232-19.000.
White, Thomas Paul. Transversely adjustable boot. 3,748,756, Cl. 36-2.50b.
White, William D.; and Lynch, Charles R., to Texaco Inc. Means and method for an on-line determination of the flash point of lube oil fractions. 3,748,894, Cl. 73-36.000.
Whitney, Herbert A., to United Aircraft Corporation. One dimension cam tracer for an automatic milling machine. 3,748,964, Cl. 90-13.00b.
Whittaker Corporation: *See—*
Senter, Louis; and Johnson, Robert E., 3,749,450.
Whitten, David E.: *See—*
United States of America, National Aeronautics and Space Administration, 3,749,123.
Whittington, George E. Angle head safety razor. 3,748,735, Cl. 30-70.000.
Widera, Otto F., to Ladish Co. Method and apparatus for locating stock in forming dies. 3,748,887, Cl. 72-345.000.
Widerby, Lennart; and Svensson, Stig, to Aktiebolaget Svenska Flaktfabriken. Arrangement at buildings assembled of pre-fabricated wall and roof element. 3,748,803, Cl. 52-303.000.
Wiechert, Rudolf; and Steinbeck, Hermann, to Schering Aktiengesellschaft. 15 alpha, 16 alpha-methylene steroids and processes for their production and use. 3,749,742, Cl. 260-397.400.
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, to Boehringer Mannheim Gesellschaft mit beschrankter Haftung. Certain 2-mercapto-[2,3-d] pyrimidine-4(3H)-ones. 3,749,724, Cl. 260-256.50r.
Wieg, Heinrich J., to Bendix Corporation, The. Measuring machine. 3,749,501, Cl. 356-169.000.
Wiesner, Richard, to Siemens Aktiengesellschaft. Method for mounting semiconductor components. 3,748,726, Cl. 29-580.000.
Wilchynski, Ronald E.: *See—*

Privee, Ralph A.; and Wilchynski, Ronald E., 3,749,532.

Wilcox, Jack E., to United States of America, Air Force. Pulse coding system. 3,750,148, Cl. 340-351.000.

Wildman, Alexander J., to Consyne Corporation. Orthodontic bracket. 3,748,740, Cl. 32-14.00a.

Wilkes, Lambert H.; and Jones, Joseph K., to Cotton, Incorporated. Seed cotton handling apparatus. 3,749,003, Cl. 100-35.000.

Wilkins, Paul E.; and Budd, Allan L., to Monitor Labs, Inc. Gas analyzer utilizing infrared emission from gaseous molecules. 3,749,495, Cl. 356-51.000.

Wilks, Phillip H.: *See—*
Scammon, Lawrence W., Jr.; Grant, Clarence L.; and Wilks, Phillip H., 3,749,763.

Willems, Hans: *See—*
Guttmann, Stephan; Sandrin, Edmond; Pless, Janos; and Willems, Hans, 3,749,703.

Willems, Jozef Frans, to Gevaert-Agfa N.V. Development of photographic silver halide material. 3,749,575, Cl. 96-66.300.

Willens, Jozef Frans: *See—*
Vrancken, Marcel Nicolas; and Willens, Jozef Frans, 3,749,707.

Willey, Sally Margaret. Buckles. 3,748,700, Cl. 24-172.000.

Williams, Arthur; and Davenport, Donald Ray, to Richen Inc. Mounting assembly for looms and the like. 3,749,340, Cl. 248-24.000.

Williams, Darrell Andrew; Wisinski, Adam Prus; and Hay, David Gilbert, to ICI Australia Limited. Adjustable close guide. 3,749,297, Cl. 226-199.000.

Williams, David R., 50% to Savage, Mary Jane. Facial treatment apparatus. 3,749,092, Cl. 128-256.000.

Williams, Roy M., Jr., to Sanders Associates, Inc. Current steering amplifier. 3,750,039, Cl. 330-13.000.

Williams, Thurston V. Autopilot system controlling entry of a craft into forbidden zones. 3,749,335, Cl. 244-77.00b.

Williamson, Donald E., to Cordis Corporation. Nonpolarizable muscle stimulating electrode. 3,749,101, Cl. 128-418.000.

Willis, Clarence Jesse: *See—*
Bankert, Jon Calvin, Jr.; Lutchansky, Milton; Osifchin, Nicholas; and Willis, Clarence Jesse, 3,750,058.

Willis, Roland G.; and Wabnitz, Herbert E., Jr., to Eastman Kodak Company. Process for inhibiting the bleaching of photographic silver images. 3,749,572, Cl. 96-4.000.

Willoughby, John H.; and Broome, Barry G. Anamorphic lens system. 3,749,477, Cl. 350-181.000.

Willson, James K. V.; and Eskridge, Marshall. Vascular tissue removing device. 3,749,085, Cl. 128-2.00b.

Wilson, Arthur C., to General Electric Company. Windowed oven door with rotatable inner panel. 3,749,081, Cl. 126-200.000.

Wilson, David G., to Massachusetts Institute of Technology. Automatic zone-fare ticketing for public transportation vehicles. 3,749,219, Cl. 194-4.00r.

Wilson, John R.; and Shariff, Sadig A., to Westinghouse Electric Corporation. Switch-operating mechanism with protective shutter. 3,749,862, Cl. 200-50.0aa.

Wilson, Richard L.; and Worbois, Robert J., to Westinghouse Air Brake Company. Apparatus for detecting emergency venting of brake pipe. 3,749,453, Cl. 303-67.000.

Wilson, Robert M., to Dare Products, Inc. Coreless double flanged insulator. 3,749,819, Cl. 174-158.00f.

Wiltsey, Howard E.: *See—*
Jaeschke, Ralph L.; Moyer, William H.; and Wiltsey, Howard E., 3,749,216.

Winchell, Harry S.: *See—*
Barak, Morton; and Winchell, Harry S., 3,749,556.

Windings Inc.: *See—*
Newman, James W., 3,748,817.

Windmoller & Holscher: *See—*
Kuck, Helmut, 3,748,973.
Upmeier, Hartmut, 3,749,540.

Winslow, Lester M.: *See—*
Smith, Sidney T.; and Winslow, Lester M., 3,749,962.

Winter, Ronald C.; and Knief, Enno A., to Cutler-Hammer, Inc. Multiposition bi-directional rotary means for a switch or the like. 3,748,915, Cl. 74-128.000.

Winterburn, Charles Barry; and Scholes, Thomas, to Winterburn, Joseph, Limited. Roll doctor apparatus. 3,748,686, Cl. 15-256.510.

Winterburn, Joseph, Limited: *See—*
Winterburn, Charles Barry; and Scholes, Thomas, 3,748,686.

Wintershall Aktiengesellschaft: *See—*
Bulian, Walter; and Dittmar, Armin, 3,748,827.

Wisconsin Alumni Research Foundation: *See—*
Walters, John P., 3,749,975.

Wise, Raleigh Warren: *See—*
Fraleigh, Marion Foster; and Wise, Raleigh Warren, 3,748,841.

Wisinski, Adam Prus: *See—*
Williams, Darrell Andrew; Wisinski, Adam Prus; and Hay, David Gilbert, 3,749,297.

Wissmann, Hans: *See—*
Geiger, Rolf; Wissmann, Hans; Konig, Wolfgang; and Azadian, Genevieve, nee Boulanger, 3,749,706.

Wittrock, Edward P.: *See—*
United States of America, National Aeronautics and Space Administration, 3,749,205.

Wli, Peter H. L., to American Home Products Corporation. Alkyl esters of substituted phenylsulfonylalkanoic acids. 3,749,750, Cl. 260-470.000.

Wojcik, David S., to Owens-Illinois, Inc. Bulk erase system for gas discharge display panels. 3,750,159, Cl. 340-324.00m.

Wojcik, Gerald E.: *See—*
Schmersal, Larry J.; and Wojcik, Gerald E., 3,749,959.

Wolcott, Glenn R., to Penn Aircraft Products, Incorporated. Flaring tool strap mount. 3,748,886, Cl. 72-316.000.

Wolcott, Robert E.: *See—*
Bailey, Edward A.; and Wolcott, Robert E., 3,749,454.

Wold, Lars Espen: *See—*
Kylberg, Bengt J.; and Wold, Lars Espen, 3,749,568.

Woletz, Robert M.: *See—*
Singer, M. Leonard; and Woletz, Robert M., 3,748,879.

Wolfelsperger, Robert O.; and Pinto, Patrick J., to Gulf Oil Corporation. Folding apparatus. 3,749,393, Cl. 270-67.000.

Wolff, Vernon Clare, Jr.: *See—*
Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., 3,749,637.

Wolter, Heinz, to Voss, Josef, KG, Firma. Steering lock, in particular for automotive vehicles. 3,748,877, Cl. 70-186.000.

Wong, Alfred Y.; Nuding, James M.; and Lucky, Zalton J. Electronic conference monitoring system. 3,750,137, Cl. 340-330.000.

Wood, William P.: *See—*
Robinson, Charles W.; Merklin, Kenneth E.; and Wood, William P., 3,749,314.

Woodfill, Larry R., to Lee, Raymond, Organization, Inc., The. Nut harvesting apparatus. 3,748,838, Cl. 56-328.000.

Woodhead, Daniel, Inc.: *See—*
Stoll, Russell F.; Reed, Alan B.; and Buzek, Vernon T., 3,749,871.

Woodman, Brian W.: *See—*
Arnold, William C.; Lendway, Joseph K.; Woodman, Brian W.; McGeehan, Michael T.; and Perrin, David P., 3,748,957.

Woodrow, Harold E.: *See—*
Hill, William J.; Starvaski, Raymond R.; and Woodrow, Harold E., 3,749,256.

Wooten, George W.; Iltis, Rumult; and Johnson, Victor L., to Monsanto Research Corporation. Chemiluminescent method and apparatus. 3,749,929, Cl. 250-369.000.

Worbois, Robert J.: *See—*
Wilson, Richard L.; and Worbois, Robert J., 3,749,453.

Worcester, Joseph A., to General Electric Company. Frequency switching circuitry for varactor tuned radio receivers. 3,750,030, Cl. 325-422.000.

Worden, Nelson B.: *See—*
Fitzmayer, Louis H.; and Worden, Nelson B., 3,749,875.

Wreghitt, Kenneth W.; Pusfy, Peter Shirley; and Munro, Donald Gilbert, to Avco Corporation. Modular container. 3,749,273, Cl. 220-1.500.

Wrigley, Wm., Jr., Company: *See—*
Litchfield, John H.; and Vely, Victor G., 3,749,766.

Wyckoff, Garry D.: *See—*
Cherk, Ester; and Wyckoff, Garry D., 3,748,779.

Wynants, Marcelle. Form of brassiere. 3,749,102, Cl. 128-505.000.

Xepex Industries, Inc.: *See—*
Jones, Charles Wright, 3,749,300.

Yagi, Motoi; and Kawamura, Yoshihisa, to Tokyo Shibaura Electric Co., Ltd. Magnetic head having a wedge shaped projection extending over void space between core halves. 3,749,850, Cl. 179-100.20c.

Yahano, Kanji: *See—*
Kushima, Kosei; and Yahano, Kanji, 3,749,598.

Yamaguchi, Michio: *See—*
Usui, Keizaburo; Mitsuashi, Ken Ichi; and Yamaguchi, Michio, 3,749,419.

Yamamoto, Akira: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,749,710.

Yamamoto, Yasuhiko; Shimada, Sugao; and Matsuno, Suguru, to New Nippon Electric Company, Ltd. Apparatus for manufacturing discharge lamps. 3,749,468, Cl. 316-30.000.

Yamanaka, Tsutomu: *See—*
Sakakibara, Shupei; and Yamanaka, Tsutomu, 3,749,705.

Yamashita Iron Works Ltd.: *See—*
Yamashita, Umeo, 3,749,257.

Yamashita, Umeo, to Yamashita Iron Works Ltd. Unloading machine. 3,749,257, Cl. 214-8.50a.

Yamazaki, Hisao: *See—*
Kawaguchi, Kunihiko; Takahashi, Kenji; Kazama, Hidemichi; Ono, Mitsuzo; Yamazaki, Hisao; and Takeda, Yoshimitsu, 3,749,023.

Yamazaki, Yuichi: *See—*
Iabiichi, Yukio; Yamazaki, Yuichi; Saito, Takao; and Kaiaoka, Toshimitsu, 3,749,220.

Yanagawa, Nobuyuki, to Ricoh Co., Ltd. Collator. 3,749,392, Cl. 270-58.000.

Yasui, Toshiko: *See—*
Muraoka, Hisashi; Tsutsumi, Hiroshi; Ohashi, Taizo; Sumitomo, Yasusuke; and Yasui, Toshiko, 3,749,619.

Yazu, Shuji: *See—*
Hara, Akio; and Yazu, Shuji, 3,749,656.

Yerkes, John G., Jr. Model for tooth color matching. 3,748,741, Cl. 32-71.000.

Yoshimura, Chozo, to Okuno Chemical Industry Company Limited. Method for sealing anodized aluminum. 3,749,596, Cl. 117-127.000.

Yoshimura, Hirofumi; Takahata, Hisatoshi; Furuhata, Akio; and Nishimura, Susumu, to Kabushiki Kaisha Yashica. Exposure time controls for cameras operating with flash illumination. 3,748,978, Cl. 95-10.0ce.
Yoshitomi Pharmaceutical Industries: *See—*
Sakakibara, Shupei; and Yamanaka, Tsutomu, 3,749,705.
Young, David E., to Schlumberger Technology Corporation. Well packer apparatus. 3,749,166, Cl. 166-123.000.
Young, David E., to Schlumberger Technology Corporation. Well tool anchoring apparatus. 3,749,167, Cl. 166-217.000.
Young, Jesse R. Artist's aid apparatus. 3,749,472, Cl. 350-121.000.
Young, John S., to GTE Automatic Electric Laboratories, Incorporated. Ring trip circuit. 3,749,846, Cl. 179-84.00r.
Young, William A., Jr.: *See—*
Babbitt, John H., Jr.; and Young, William A., Jr., 3,748,923.
Zabsky, John M.: *See—*
Cole, Larry E.; and Zabsky, John M., 3,748,852.
Zagorski, Edward J.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,749,394.
Zahlava, Bruce A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,748,905.
Zenco Engineering Corporation: *See—*
Zenkich, Ilias, 3,750,094.
Zenith Radio Corporation: *See—*
De Jule, Michael C., 3,749,972.
Ely, William G.; and Sinclair, John C., 3,749,853.
Moore, John H., 3,749,825.
Subramanian, Sundaram, 3,750,056.
Zenkich, Ilias, to Zenco Engineering Corporation. Electrical connector. 3,750,094, Cl. 339-218.00r.
Zepf, Hans-Rudolf. Bucket tooth construction for the buckets of construction equipment. 3,748,763, Cl. 37-142.00r.
Zhuchin, Vlarimir Nikiforovich: *See—*
Paton, Boris Evgenievich; Pryanishnikov, Igor Stepanovich; Movchan, Boris Alexeevich; Zhuchin, Vlarimir Nikiforovich; Topilin, Valentin Vasilievich; Perepelitsa, Igor Vasieievich; Tikhonovsky, Alexel Lavrentievich; Kurapoy, Jury Anatolievich; Misjura, Rostslav Spiridonovich; and Kucherenko, Pavel Petrovich, 3,749,149.
Zill, Fred W., to Schlumberger Technology Corporation. Downhole acoustic logging control system. 3,750,098, Cl. 340-18.334.
Zink, George: *See—*
Stearns, Burdett Kinney; Graham, David Alan; Seemann, James Marion; and Zink, George, 3,748,958.
Zink, John, Company: *See—*
Reed, Robert D.; Zink, John Smith; and Goodnight, Hershel E., 3,749,546.
Zink, John S.; Reed, Robert D.; and Goodnight, Hershel E., 3,749,548.
Zink, John S.; Reed, Robert D.; and Goodnight, Hershel E., to Zink, John, Company. High intensity burner. 3,749,548, Cl. 431-158.000.
Zink, John Smith: *See—*
Reed, Robert D.; Zink, John Smith; and Goodnight, Hershel E., 3,749,546.
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., to Warner-Lambert Company. 2-Oxo-N-(2-thiazolyl)-3-indolinecarboxamide. 3,749,731, Cl. 260-306.80r.
Zinser-Textilmachinen GmbH: *See—*
Fetzer, Gustav, 3,749,955.
Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung: *See—*
Roethke, Ernst; and Guttler, Hermann, 3,749,327.
Zitkus, Wayne J., to Owens-Illinois, Inc. Laser assembly. 3,750,050, Cl. 331-94.50d.
Zoecon Corporation: *See—*
Diekman, John D., 3,749,736.
Siddall, John B.; and Liddell, Norman E., 3,749,743.
Siddall, John B.; and Henrick, Clive A., 3,749,744.
Zolnosky, Larry D.: *See—*
Carlson, John A.; Kempke, William G.; Schweihs, Jess J.; Syverson, Marschelle M. G.; and Zolnosky, Larry D., 3,749,008.
Zwack, Robert R.: *See—*
Lebras, Louis R.; Christenson, Roger M.; and Zwack, Robert R., 3,749,657.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becker, Kenneth F., L. D. Taylor, and W. J. Zoya, to Sperry Rand Corp. Power transmission. Re. 27,712, 7-31-73, Cl. 137—81.5.

Clauson, Arthur D., to Sun Electric Corp. Actuated pin contact switch. Re. 27,713, 7-31-73, Cl. 200—81.9.

Dumore Co., The: *See*—
Steibel, James P. Re. 27,771.

Ideal Security Hardware Corp.: *See*—
Waldo, Russell W. Re. 27,714.

Porter, Wellington W. Pickling cucumber harvester. Re. 27,715, 7-31-73, Cl. 56—327.

Sperry Rand Corp.: *See*—
Becker, Kenneth F., Taylor, and Zoya. Re. 27,712.

Steibel, James P., to The Dumore Co. Controllable motion and force converter. Re. 27,711, 7-31-73, Cl. 74—25.

Sun Electric Corp.: *See*—
Clauson, Arthur D. Re. 27,713.

Taylor, Le Roy D.: *See*—
Becker, Kenneth F., Taylor, and Zoya. Re. 27,712.

Waldo, Russell W., to Ideal Security Hardware Corp. Pneumatic door closer. Re. 27,714, 7-31-73, Cl. 16—66.

Zoya, Walter: *See*—
Becker, Kenneth F., Taylor, and Zayo. Re. 27,712.

LIST OF PLANT PATENTEES

Culbert, John R. Chrysanthemum plant. 3,379, 7-31-73. Cl. 74.

Courtrakis, Steve. Azalea plant. 3,384, 7-31-73, Cl. 56.

DeRuiter, Gijsbert. Rose plant. 3,383, 7-31-73, Cl. 29.

Elkelenboom, Adriaan. Chrysanthemum. 3,378, 7-31-73, Cl. 76.

Kordes, Reimer. Rose plant. 3,380, 7-31-73, Cl. 25.

Tantau, Mathias. Rose plant. 3,382, 7-31-73, Cl. 25.

Warriner, William A. Rose plant. 3,381, 7-31-73, Cl. 20.

LIST OF DESIGN PATENTEES

AMP Inc.: *See*—
Brinser, Stanley B., and Kunkle. 227,990.

Abbott, Murry, to Cornell Mfg. Co., Combination brush and comb. 227,948, 7-31-73, Cl. D4—21.

Abbott, Murry, to Cornell Mfg. Co. Combination brush and comb. 227,949, 7-31-73, Cl. D4—21.

Abbott, Robert J, Jr., to Owens-Illinois Inc. Terminal 227,992, 7-31-73, Cl. D26—5.

Abrahamsen, Thomas C.: *See*—
Clayton, Richard G., and Abrahamsen. 227,995.

Abramson, Louis D., to Life-Time Companies, Inc. Eye mirror. 228,042, 7-31-73, Cl. D86—10.

Aero Electronics Development Co., Inc.: *See*—
Wood, June. 228,037.
Wood, June. 228,038.
Wood, June. 228,039.

Alarm Device Mfg. Co.: *See*—
Guthart, Leo A. 227,988.

Allen, Robert Y.: *See*—
Klamer, Reuben B., Allen, and Shaw. 227,999.

American Optical Corp.: *See*—
Shindler, Anthony. 228,926.

American Seating Co.: *See*—
Sundberg, Carl W., Ferar, and Barecki. 227,956.

Askin, Byron E., to V-M Corp. Vertical record player or similar article. 228,025, 7-31-73, Cl. D56—4.

Barecki, Chester J.: *See*—
Sundberg, Carl W., Ferar, and Barecki. 227,956.

Barth, Gerald D., and R. E. Jennings, to Illinois Tool Works Inc. Methal penetrating staple. 227,976, 7-31-73, Cl. D8—266.

Bethune, Ade, to Terra-Sancta Creations, Inc. Pendant. 228,015, 7-31-73, Cl. D45—16.

Bish, Robert M., and J. W. Davis. Protector for loaves of bread. 227,977, 7-31-73, Cl. D9—184.

Bird, Stanford W., to Plastronics Corp. Packaging container. 227,979, 7-31-73, Cl. D9—231.

Brinser, Stanley Byron, and J. R. Kunkle, to AMP Inc. Multi-contact electrical connector assembly. 227,990, 7-31-73, Cl. D26—1.

Brown, Donald W. Outlet protector. 227,974, 7-31-73, Cl. D8—179.

Burkhart, Merle K., F. S. Fell, and C. L. Case, to Hesston Corp. Combined mower conditioner and windrower. 228,010, 7-31-73, Cl. D40—1.

Burns, Lloyd G. Fish scaler. 228,021, 7-31-73, Cl. D55—1.

Burroughs Corp.: *See*—
Clayton, Richard G., and Abrahamsen. 227,995.

Case, Cercil L.: *See*—
Burkhart, Merle K., Fell, and Case. 228,010.

Centronics Data Computer Corp.: *See*—
Howard, Robert. 228,030.

Chapin, Richard M., to Dolly Madison, Industries. Chair. 227,959, 7-31-73, Cl. D6—75.

Chapin, Richard M., to Dolly Madison Industries. Peal for furniture. 227,969, 7-31-73, Cl. D6—192.

Chasen, Lee Richard, to Coats & Clark, Inc. Pull. 227,973, 7-31-73, Cl. D8—147.

Clayton Richard G., and T. C. Abrahamsen, to Burroughs Corp. Magnetic tape drive unit. 227,995, 7-31-73, Cl. D26—5.

Coats & Clark, Inc.: *See*—
Chasen, Lee R. 227,973.

Cobb, George R. Telephone sterilizer. 228,035, 7-31-73, Cl. D83—1.

Cohen, Judy A., to General Mills Fun Group, Inc. Puzzle board. 228,006, 7-31-73, Cl. D34—15.

Conner, James M., and H. J. Salvador, to Polaroid Corp. Rear projection viewer. 228,029, 7-31-73, Cl. D61—1.

Cornell Mfg. Co.: *See*—
Abbott, Murry. 227,948.
Abbott, Murry. 227,949.

Costabile, Eugene J., to Mohasco Industries, Inc. Chair. 227,952, 7-31-73, Cl. D6—26.

Creative Creations, Inc.: *See*—
Feuer, Perry. 228,016.
Feuer, Perry. 228,017.

Crosskill, Alfred F. Stairnosing. 227,980, 7-31-73, Cl. D13—6.

Cuccio, John, to Sybron Corp. Combined barometer thermometer and hydrometer. 228,019, 7-31-73, Cl. D52—7.

Cuccio, John, to Sybron Corp. Combined weather instrument and desk set. 228,020, 7-31-73, Cl. D52—7.

Davidoff, Gregor. Picture frame. 227,970, 7-31-73, Cl. D6—242.

Davis, Jewell W.: *See*—
Bish, Robert M., and Davis. 227,977.

Diamond, Murray A., to Sentinel Container Corp. Expandable reel for receiving wound flexible material. 227,975, 7-31-73, Cl. D8—220.

Dolly Madison Industries: *See*—
Chapin, Richard M. 227,959.
Chapin, Richard M. 227,969.

Duern, Gordan L., and D. S. Griffin. Coffe table 227,966, 7-31-73, Cl. D6—177.

Eckel, Alan F., to Sears, Roebuck and Co. Can opener. 227,972, 7-31-73, Cl. D8—36.

Effkay Development Corp.: *See*—
Keenan, John. 227,994.

Ekuan, Kenji, to Ikeda, Minoru, President of France Bed Co., Ltd. Chair. 227,960, 7-31-73, Cl. D6—78.

Ekuan, Kenji, to France Bed Co., Ltd. Chair. 227,961, 7-31-73, Cl. D6—78.

Ekuan, Kenji, to Ikeda, Minoru, President of France Bed Co., Ltd. Chair. 227,962, 7-31-73, Cl. D6—78.

Ethyl Corp.: *See*—
LaBorde, Joseph N. 227,983.
LaBorde, Joseph N. 227,981.

Fell, Ferol S.: *See*—
Burkhart, Merle K., Fell, and Case. 228,010.

Ferar, Montgomery: *See*—
Sundberg, Carl W., Ferar, and Barecki. 227,956.

Fetty, Harold D., to The Goodyear Tire & Rubber Co. Tire. 228,045, 7-31-73, Cl. D9—20.

Feuer, Perry, to Creative Creations, Inc. Combined flashlight and detachable witch mask therefor. 228,016, 7-31-73, Cl. D48—24.

Feuer, Perry, to Creative Creationgs, Inc. Combined flashlight and detachable skeleton mask therefor. 228,017, 7-31-73, Cl. D48—24.

Fisher, Norris F. Chair. 227,958, 7-31-73, Cl. D6—69.

Fleischer, Henry: *See*—
Jenkins, Roy M. 228,033.

Fletcher, Helen H. Segmented flower guard. 228,007, 7–31–73, Cl. D35—3.
Fontaine, Raymond C., to Textron, Inc. Expansible link chain for a bracelet or similar article. 228,012, 7–31–73, Cl. D45—4.
Fontain, Raymond C., to Textron Inc. Expansible link chain for a bracelet or similar article. 228,013, 7–31–73, Cl. D45—4.
Fontaine, Raymond C., to Textron, Inc. Expansible link chain for a bracelet or similar article. 228,014, 7–31–73, Cl. D45—4.
Forshee, Grace F. Hanging rack. 227,965, 7–31–73, Cl. D6—113.
Foster Grant Co., Inc.: *See*—
Leblanc, Conrad, and Marchi. 228,028.
France Bed Co., Ltd.: *See*—
Ekuan, Kenji. 227,961.
France, David W.: *See*—
Schaefer, Hans F., and France. 227,996.
G.M.T., S.A.: *See*—
Tabor, Marcel Jean. 228,031.
GTE Sylvania Inc.: *See*—
Heckel, Donald T., Hill, and Pfeiffer. 228,027.
Garrison, Harold K.: *See*—
White, Allen A., Garrison, and Weddle. 228,011.
General Fireproofing Co., The: *See*—
Prislow, Alfred J. 227,953.
General Foods Corp.:.*See*—
Stubbmann, Albert. 228,005.
General Mills Fun Group, Inc.: *See*—
Cohen, Judy A. 228,006.
Geisel, Dennis M. Electric cord socket. 227,989, 7–31–73, Cl. D226—1.
Gibson, Sidney, to Noresco Mfg. Co., Ltd. Loudspeaker module. 227,998, 7–31–73, Cl. D26—14.
Gill, Don R., to Mohasco Industries, Inc. Combined chair and collapsible tray unit. 227,954, 7–31–73, Cl. D6—42.
Goodyear Tire & Rubber Co., The: *See*—
Fetty, Harold D. 228,045.
Hammond, Philip S. 228,046,
Grauso, Robert N., and J. J. Morena, to C. F. Martin & Co. Snare drum throw-off or similar article. 228,023, 7–31–73, Cl. D56—1.
Griffin, Donald S.: *See*—
Duern, Gordan L., and Griffin. 227,966.
Guthart, Leo A., to Alarm Device Mfg. Co. Photoflectric device. 227,988, 7–31–73, Cl. D26—1.
Hammond, Philip S., to The Goodyear Tire & Rubber Co. Tire. 228,046, 7–31–73, Cl. D90—20.
Heckel, Donald T., W. R. Hill, and R. H. Pfeiffer, to GTE Sylvania Inc. Night viewing device. 228,027, 7–31–73, Cl. D57—1.
Hesston Corp.: *See*—
Burkhart, Merle K., Fell, and Case. 228,010.
White, Allen A., Garrison, and Weddle. 228,011.
Hill, William R.:.*See*—
Heckel, Donald T., Hill, and Pfeiffer. 228,027.
Hollister, Harry, W. Combined cigarette snuffer and ashtray liner or similar article. 228,036, 7–31–73, Cl. D85—2.
Howard, Robert, to Centronics Data Computer Corp. Printer housing. 228,030, 7–31–73, Cl. D64—11.
Hughes, Gordon G.: *See*—
Lagorce, Paul D. 227,987.
Ideal Recreational Products, Inc.: *See*—
Lang, Milan, and Mendelow. 227,982.
Lang, Milan, and Mendelow. 227,984.
Ikeda, Minoru, President of France Bed Co., Ltd.: *See*—
Ekuan, Kenji. 227,960.
Ekuan, Kenji. 227,962.
Illinois Tool Works Inc.: *See*—
Barth, Gerald D., and Jennings. 227,976.
Jenkins, Roy M., deceased; by H. Fleischer, administrator, to Lindy Pen Co. Desk pen. 228,035, 7–31–73, Cl. D74—17.
Jennings, Ralph E.: *See*—
Barth, Gerald D., and Jennings. 227,976.
Keenon, John, to Effkay Development Corp. Input terminal. 227,994, 7–31–73, Cl. D26—5.
Kelley, James O. *See*—
Propst, Robert L., and Kelley. 227,964.
Kieves, Carry. Self-actuating holder for phonograph records. 227,968, 7–31–73, Cl. D6—185.
Kitson, Gerald L. Poultry housing service vehicle. 228,024, 7–31–73, Cl. D55—1.
Klamer, Reuben B., R. Y. Allen, and M. Shaw, said Allen and said Shaw assor., to said Klamer. Body component for an animal toy or the like. 227,999, 7–31–73, Cl. D34—2.
Krapowitcz, Jacob A. Portable hair curler appliance casing. 228,041, 7–31–73, Cl. D86—10.
Krusko, Evelyn H., to Scott Paper Co. Disposable diapers. 228,034, 7–31–73, Cl. D83—1.
Kumagai, Kazuo, Ueda, and Takahashi, to Sanyo Electric Co., Ltd. Electronic calculator. 227,991, 7–31–73, Cl. D26—5.
Kunkle, James R.: *See*—
Brinser, Stanley B., and Kunkle. 227,990.
Kurosu, Teisuke, to Matsushita Electric Industrial Co., Ltd. Electronic calculator. 227,993, 7–31–73, Cl. D26—5.
LaBorde, Joseph N., to Ethyl Corp. Window jamb or similar article. 227,981, 7–3–73, Cl. D13—6.
LaBorde, Joseph N., to Ethyl Corp. Snap-on casing or similar article. 227,983, 7–31–73, Cl. D13—6.
Lagorce, Paul D., to Gordon G. Hughes. Hand held air blower. 227,987, 7–31–73, Cl. D23—162.
Lang, Milan, and R. Mendelow, to Ideal Recreational Products, Inc. Swimming pool coping. 227,982, 7–3–73, Cl. D13—1.
Lang, Milan, and R. Mendelow, to Ideal Recreational Products, Inc. Swimming pool coping. 227,984, 7–31–73, Cl. D13—1.
Leblanc, Conrad, and V. Marchi, to Foster Grant Co., Inc. Pair of sunglasses. 228,028, 7–31–73, Cl. D57—1.
Leib, Roger K. Chair. 227,955, 7–31–73, Cl. D6—47.
Life-Time Companies, Inc.: *See*—
Abramson, Louis D. 228,042.
Lindy Pen Co.: *See*—
Jenkins, Roy M. 228,033.
MacManus, John. Forcing bag. 227,978, 7–31–73, Cl. D9—194.
Mancusco, Mayme. Doll. 228,000, 7–31–73, Cl. D34—4.
Marchi, Vitalino: *See*—
Leblanc, Conrad, and Marchi. .228,028.
Martin, C. F., & Co.: *See*—
Grauso, Robert N., and Morena. 228,023.
Marsalka, Joseph P. Data coupler. 227,997, 7–31–73, Cl. D26—14.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kurosu, Teisuke. 227,993.
Mayer, Frank, & Associates, Inc.: *See*—
Nielsen, Robert B. 227,951.
Mendelow, Robert: *See*—
Lang, Milan, and Mendelow. 227,982.
Lang, Milan, and Mendelow. 227,984.
Mohasco Industries, Inc.: *See*—
Costabile, Eugene J. 227,952.
Gill, Don R. 227,954.
Winrow, Thomas. 227,957.
Morena, John J.: *See*—
Grauso, Robert N., and Morena. 228,023.
Napoli, Leonard: *See*—
Riccio, Frank J., and Napoli. 228,004.
Nielsen, Robert B., to Frank Mayer & Associates, Inc. Cigarette merchandiser. 227,951, 7–31–73, Cl. D6—24.
Noresco Mfg. Co., Ltd.: *See*—
Gibson, Sidney. 227,998.
Okiyama, Masaharu. Barber chair. 227,950, 7–31–73, Cl. D6—22.
Owens-Illinois, Inc.: *See*—
Abbott, Robert J., Jr. 227,992.
Pellow, Donald L. Front cover for bathroom tissue dispenser. 227,963, 7–31–73, Cl. D6—97.
Pfeiffer, Robert H.: *See*—
Heckel, Donald T., Hill, and Pfeiffer. 228,027.
Plastronics Corp.: *See*—
Bird, Stanford W. 227,979.
Polaroid Corp.: *See*—
Conner, James M., and Salvador. 228,029.
Prislow, Alfred J., to The General Fireproofing Co. Chair. 227,953, 7–31–73, Cl. D6—30.
Propst, Robert L., and J. O. Kelley. Locker. 227,964, 7–31–73. Cl. D6—150.
Riccio, Frank J., and L. Napoli. Hand exerciser. 228,004, 7–31–73, Cl. D34—5.
Ruple, Kenneth W. Weather vane. 228,018, 7–31–73, Cl. D52—6.
Salvador, Henry J.: *See*—
Conner, James M., and Salvador. 228,029.
Samyo Electric Co., Ltd.: *See*—
Kumagai, Kazuo, Ueda, and Takahashi. 227,991.
Scarne, John. Game table. 227,967, 7–31–73, Cl. D6—177.
Schaefer, Hans F., Jr., and D. W. France, to USM Corp. Control pendant. 227,996, 7–31–73, Cl. D26—13.
Schaffer, Ezra. Combined refrigeration unit and air duct for dwellings. 227,986, 7–31–73, Cl. D23—139.
Scott Paper Co.: *See*—
Krusko, Evelyn H. 228,034.
Sears, Roebuck and Co.: *See*—
Eckel, Alan F. 227,972.
Sentinel Container Corp.: *See*—
Diamond, Murray A. 227,975.
Shaw, Melvin: *See*—
Klamer, Reuben B., Allen, and Shaw. 227,999.
Shindler, Anthony, to American Optical Corp. Pair of spectacles. 228,026, 7–31–73, Cl. D57—1.
Sloop, Conrad B. Combined backpack and foldable carrying frame. 228,043, 7–31–73, Cl. D87—1.
Sietmann, Vernon H. Inlet funnel for grain drying bins. 228,022, 7–31–73, Cl. D55—1.
Silverman, Neil H. Seesaw. 228,002, 7–31–73, Cl. D34—5.
Spencer, Robert G. Fishing lure. 227,985, 7–31–73, Cl. D22—27.
Stubbmann, Albert, to General Foods Corp. Maze puzzle. 228,005, 7–31–73, Cl. D34—15.
Sundberg, Carl W., M. Ferar, and C. J. Barecki, to American Seating Co. Chair. 227,956, 7–31–73, Cl. D6—66.
Swenn, Joseph W., to Textron Inc. Pull tab for a-slide fastener. 227,947, 7–31–73, Cl. D2—415.
Sybron Corp.: *See*—
Cuccio, John. 228,019.
Cuccio, John. 228,020.
Tabor, Marcel Jean, to G.M.T., S.A. Boat. 228,031, 7–31–73, Cl. D71—1.
Takahashi, Hiroshi: *See*—
Kumagai, Kazuo, Ueda, and Takahashi. 227,991.
Telesco Brophey Ltd.: *See*—
Weber, Heinz. 228,044.
Terra-Sancta Creations, Inc.: *See*—
Bethune, Ade. 228,015.
Textron Inc.: *See*—
Swenn, Joseph W. 227,947.
Fontaine, Raymond C. 228,012.
Fontaine, Raymond C. 228,013.
Fontaine, Raymond C. 228,014.
Thorud, Richard A., to Toro Mfg. Corp. Combined rotary

mower housing and discharge deflector. 228,008, 7–31–73. Cl. D40—1.
Thorud, Richard A., to Toro Mfg. Corp. Combination discharge deflector, bag chute and bag for mowers and the like. 228,009, 7–31–73, Cl. D40—1.
Toro Mfg. Corp.: *See*—
Thorud, Richard A. 228,008.
Thorud, Richard A. 228,009.
USM Corp.: *See*—
Schaefer, Hans F., Jr., and France. 227,996.
Ueda, Manatsu: *See*—
Kumagai, Kazuo, Takahashi, and Ueda. 227,991.
V-M Corp.: *See*—
Askin, Byron E. 228,025.
Van Wyck International Corp.: *See*—
Weiss, Harold. 227,971.
Weddle, Gary: *See*—
White, Allen A., Garrison and Weddle. 228,011.
Warner, Richard F. Golf putter head. 228,003, 7–31–73. Cl. D34—5.
Weber, Heinz, to Telesco Brophey Ltd. Carrying case for an umbrella. 228,044, 7–31–73, Cl. D87–1.
Weiss, Harold, to Van Wyck International Corp. Juice extractor, or similar article. 227,971, 7–31–73, Cl. D7—48.
White, Allen A., H. K. Garrison, and G. Weddle, to Hesston Corp. Machine for loading and stacking crops. 228,011, 7–31–73, Cl. D40—1.
Winrow, Thomas, to Mohasco Industries, Inc. Chair. 227,957. 7–31–73, Cl. D6—69.
Wolff, Martin J. Portable hair curler appliance casing. 228,040, 7–31–73, Cl. D86—10.
Wolfson, William. Boat hull. 228,032, 7–31–73, Cl. D71—1.
Wood, June, to Aero Electronics Development Co., Inc. Container for a message transmitter and cigarette. 228,037, 7–31–73, Cl. D85—2.
Wood, June, to Aero Electronics Development Co., Inc. Container for a message transmitter and cigarette. 228,038, 7–31–73, Cl. D85—2.
Wood, June, to Aero Electronics Development Co., Inc. Container for a message transmitter and cigarettes. 228,039, 7–31–73, Cl. D85—2.

CLASSIFICATION OF PATENTS

ISSUED JULY 31, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
6 3,748,657
10 3,748,658
74 3,748,659
175 3,748,660
207 3,748,661

CLASS 3
1 3,748,662

CLASS 4
115 3,748,663
172.14 3,748,664
172.19 3,748,665

CLASS 5
R 3,748,667
61 3,748,666
296 3,748,668
348WB 3,748,669

CLASS 8
127.6 3,749,553
188 3,749,552

CLASS 9
2A 3,748,671
2C 3,748,670
347 3,748,672

CLASS 10
11R 3,748,673
72R 3,748,674

CLASS 13
1 3,749,802
9 3,749,803
13 3,749,804
20 3,749,805

CLASS 15
4 3,748,675
21A 3,748,676
21D 3,748,677
24 3,748,678
42 3,748,679
50C 3,748,680
183 3,748,681
229R 3,748,682
244R 3,748,684
248A 3,748,683
250.35 3,748,685
256.51 3,748,686

CLASS 16
66 Re.27,714
75 3,748,687
129 3,748,689
153 3,748,688

CLASS 17
11.2 3,748,691
33 3,748,690
76 3,748,692

CLASS 19
156.3 3,748,693
258 3,748,694
293 3,748,695

CLASS 21
2.5R 3,749,554

CLASS 23
252R 3,749,556
285 3,749,555
297 3,749,557

CLASS 24
16PB 3,748,696
19 3,748,697
38 3,748,698
3,748,699
172 3,748,700
204 3,748,701
263DG 3,748,702
265SH 3,748,703

CLASS 26
62B 3,748,704

CLASS 27
21 3,748,705

CLASS 28
15 3,748,706

CLASS 29
25.15 3,748,708
34A 3,748,709
96R 3,748,710
116R 3,748,711
191.2 3,749,559
191.6 3,749,558
199 3,748,712
200P 3,748,713
205R 3,748,714
211D 3,748,715
3,748,717
228 3,748,716
283 3,748,718
471.3 3,748,720
3,748,721
481 3,748,719
487 3,748,722
517 3,748,723
558 3,748,724
577 3,748,725
580 3,748,726
592 3,748,727
599 3,748,728
600 3,748,729

CLASS 30
43.1 3,748,730
3,748,732
43.6 3,748,731
60.5 3,748,734
70 3,748,735
90.1 3,748,733
151 3,748,736
294 3,748,742
358 3,748,737
394 3,748,738

CLASS 32
10A 3,748,739
14A 3,748,740
71 3,748,741

CLASS 33
174F 3,748,743
257 3,748,744

CLASS 34
10 3,748,745
82 3,748,746
122 3,748,747

CLASS 35
8A 3,748,748
11 3,748,749
19A 3,748,755
22R 3,748,750
25 3,748,751
27 3,748,752
35B 3,748,753
48R 3,748,754

CLASS 36
2.5B 3,748,756
7.3 3,748,951
11.5 3,748,757
34A 3,748,758

CLASS 37
8 3,748,759
58 3,748,760
130 3,748,761
141T 3,748,762
142R 3,748,763

CLASS 38
64 3,748,707

CLASS 40
37 3,748,764
63A 3,748,765
63R 3,748,766
65 3,748,767
104.03 3,748,768
106.52 3,748,769

CLASS 42
66 3,748,771
84 3,748,770

CLASS 43
41 3,748,772
42.1 3,748,773
3,748,774
43.13 3,748,775
103 3,748,776
114 3,748,777

CLASS 44
80 3,749,560

CLASS 46
28 3,748,778
115 3,748,779
202 3,748,780

CLASS 47
34.11 3,748,781
58 3,748,783

CLASS 49
49 3,748,782
394 3,748,785
425 3,748,784

CLASS 51
5 3,748,786
15 3,748,787
58 3,748,790
165.8 3,748,789
165.87 3,748,788
323 3,748,791
391 3,748,792

CLASS 52
10 3,748,798
64 3,748,793
79 3,748,794
86 3,748,796
98 3,748,795
144 3,748,799
167 3,748,800
173 3,748,801
187 3,748,802
303 3,748,803
426 3,748,806
484 3,748,804
632 3,748,807
644 3,748,809
665 3,748,808
668 3,748,814
714 3,748,815
742 3,748,810
745 3,748,805

CLASS 53
15 3,748,816
21FW 3,748,817
28 3,748,811
59R 3,749,998
66 3,748,812
88 3,748,818
124B 3,748,819
3,748,820
124D 3,748,797
159 3,748,821
180 3,748,822
187 3,748,823
213 3,748,824
374 3,748,813
379 3,748,825

CLASS 55
2 3,748,828
17 3,748,826
73 3,748,827
74 3,748,829
89 3,748,830
112 3,748,831
197 3,748,833
213 3,748,834
228 3,748,835
257 3,748,832
302 3,748,836
418 3,748,837

CLASS 56
327 Re.27,715
328R 3,748,839
328 3,748,838
341 3,748,840

CLASS 57
21 3,748,841
77.45 3,748,842
102 3,748,843
140R 3,748,844

CLASS 58
23A 3,748,845
26R 3,748,846
50R 3,748,847
58 3,748,848
90R 3,748,849

CLASS 60
13 3,748,850
19 3,748,851
39.65 3,748,852
3,748,853
226R 3,748,854
290 3,748,855
357 3,748,856
388 3,748,857
413 3,748,858
464 3,748,859
563 3,748,860

CLASS 61
45D 3,748,861
3,748,862
53 3,748,863

CLASS 62
22 3,748,864
50 3,748,865
99 3,748,868
271 3,748,867

CLASS 64
15B 3,748,866
17A 3,748,869

CLASS 65
33 3,749,561
34 3,749,562
182R 3,749,563
184 3,749,564

CLASS 66
50B 3,748,871
69 3,748,872
78R 3,748,873
86 3,748,874
123 3,748,875
177 3,748,870

CLASS 70
18 3,748,876
186 3,748,877
218 3,748,878
232 3,748,879
248 3,748,880
388 3,748,881
416 3,748,882

CLASS 71
93 3,749,565
100 3,749,566

CLASS 72
81 3,748,883
238 3,748,884
269 3,748,885
316 3,748,886
345 3,748,887
375 3,748,888
382 3,748,889
383 3,748,890

CLASS 73
4D 3,748,891
16 3,748,892
36 3,748,894
49.2 3,748,893
67.9 3,748,895
71.5 3,748,896
118 3,748,897
168 3,748,898
170A 3,748,899
178R 3,748,900
194R 3,748,902
212 3,748,901
261 3,748,903
354 3,748,908
359 3,748,904
421.5R 3,748,905
421.5 3,748,906
423A 3,748,907
3,748,911
425.4P 3,748,909
468 3,748,910

CLASS 74
5F 3,748,912
18.2 3,748,913
25 Re.27,711
42 3,748,914
128 3,748,915
217B 3,748,916
231R 3,748,917
242.13A 3,748,918
249 3,748,919
465 3,748,920
484 3,748,921
492 3,748,922
566 3,748,923
603 3,748,925
645 3,748,926
675 3,748,927
677 3,748,924
711 3,748,928
844 3,748,929
864 3,748,930
867 3,748,931

CLASS 75
60 3,749,567
126C 3,749,568
170 3,749,569
171 3,749,570
204 3,749,571

CLASS 81
9.51 3,748,932

CLASS 82
4C 3,748,933
48 3,748,934
70.1R 3,748,935

CLASS 83
12 3,748,937
162 3,748,936
305 3,748,938
370 3,748,939
414 3,748,940
637 3,748,941
833 3,748,942

CLASS 84
1.13 3,749,806
1.17 3,749,807
1.18 3,749,808
1.22 3,748,944
1.24 3,749,809
3,749,810
312 3,748,943
330 3,748,945
380 3,748,946
485 3,748,947

CLASS 85
1R 3,748,948
46 3,748,949

CLASS 86
24 3,748,950

CLASS 87
29 3,748,952

CLASS 89
1R 3,748,953
1.87 3,748,954
1.814 3,748,955
14D 3,748,956
16 3,748,957
26 3,748,958
132 3,748,959
135 3,748,960
189 3,748,961

CLASS 90
4 3,748,962
13B 3,748,963
3,748,964
17 3,748,965

CLASS 91
364 3,748,966
387 3,748,967
420 3,748,968

CLASS 92
19 3,748,969
83 3,748,970

CLASS 93
1E 3,748,971
53M 3,748,972
93DP 3,748,973

CLASS 95
1R 3,748,975
4.5 3,748,976
10CE 3,748,974
3,748,978
3,748,989
10CT 3,748,979
11L 3,748,980
11R 3,748,985
12.2 3,748,981
15 3,748,982
19 3,748,983
3,748,984
30 3,748,990
31FM 3,748,991
31 3,748,986
36 3,748,987
3,748,992
53EB 3,748,993
85 3,748,977
89A 3,748,996
89G 3,748,995
89R 3,748,994

CLASS 96
4 3,749,572
50R 3,749,573
66.3 3,749,574
3,749,575
99 3,749,576
114 3,749,577
119 3,749,578

CLASS 98
33 3,748,997
40D 3,748,998

CLASS 99
2CD 3,749,579
9 3,749,580
14 3,749,581
48 3,749,582
59 3,749,583
69 3,749,584
100 3,749,585
113 3,749,586
128 3,749,587
132 3,749,588
313 3,748,999
425 3,749,000
499 3,749,001
536 3,749,002

CLASS 100
35 3,749,003
50 3,749,004
53 3,749,005

CLASS 101
3R 3,749,006
93C 3,749,007
3,749,008
101 3,749,024
122 3,749,009
127 3,749,010
148 3,749,011
3,749,012
227 3,749,013
425 3,749,014
426 3,749,015

CLASS 102
1R 3,749,016
4 3,749,017
33 3,749,018
34.4 3,749,019
38 3,749,020
43P 3,749,021
3,749,023
79 3,749,022

CLASS 104
25 3,749,025
156 3,749,026
172BT 3,749,027

CLASS 106
123 3,749,589
288Q 3,749,590

CLASS 107
625.6 3,749,127

CLASS 109
21.5 3,749,028

CLASS 110
7R 3,749,029
8A 3,749,032
8R 3,749,030
3,749,031
10 3,749,033

CLASS 111
4 3,749,034
85 3,749,035

CLASS 112
79R 3,749,036

117 3,749,037
121.15 3,749,038
218R 3,749,039
252 3,749,040
3,749,041

CLASS 114
106 3,749,042
3,749,043
207 3,749,044
235B 3,749,045

CLASS 115
17 3,749,046
34R 3,749,047
3,749,048

CLASS 117
21 3,749,591
62 3,749,592
68 3,749,593
104A 3,749,594
119.6 3,749,595
127 3,749,596
134 3,749,598
136 3,749,599
3,749,600
138.8F 3,749,597
218 3,749,601

CLASS 118
2 3,749,049
4 3,749,050
7 3,749,051
48 3,749,052
50 3,749,053
126 3,749,054
234 3,749,055
408 3,749,056
420 3,749,057
500 3,749,058
637 3,749,059

CLASS 119
16 3,749,060
19 3,749,061
51CF 3,749,062
61 3,749,063
158 3,749,064

CLASS 123
32EA 3,749,065
65S 3,749,066
73AF 3,749,067
90.61 3,749,068
106R 3,749,097
108 3,749,069
117R 3,749,070
119A 3,749,071
148E 3,749,073
193C 3,749,072
196R 3,749,074

CLASS 124
20R 3,749,075
31 3,749,076

CLASS 126
44 3,749,077
116R 3,749,079
121 3,749,078
191 3,749,080
200 3,749,081
343.5A 3,749,082

CLASS 128
1R 3,749,083
2B 3,749,085
2F 3,749,084
2M 3,749,086
2.08 3,749,087
2.1E 3,749,089
20 3,749,088
240 3,749,090
256 3,749,092
260 3,749,091
263 3,749,093
285 3,749,094
288 3,749,095
293 3,749,096
346 3,749,098
361 3,749,099
407 3,749,100
418 3,749,101
505 3,749,102

CLASS 131
136 3,749,103
256 3,749,104

CLASS 132
7 3,749,105
33 3,749,106

CLASS 134
19 3,749,602

CLASS 135
1 3,749,107

CLASS 136
6F 3,749,603
20 3,749,604
30 3,749,605
83R 3,749,606
3,749,607
3,749,608
170 3,749,609

CLASS 137
15 3,749,108
85 3,749,109
92 3,749,110
100 3,749,111
106 3,749,112
209 3,749,113
244 3,749,114
246.22 3,749,115
255 3,749,116
344 3,749,117
355.28 3,749,118
461 3,749,119
489.5 3,749,120
512.2 3,749,121
515.7 3,749,122
516.27 3,749,123
587 3,749,124
596.16 3,749,125
613 3,749,126
625.61 3,749,128
625.62 3,749,129
831 Re.27,712

CLASS 138
42 3,749,130
89 3,749,131
113 3,749,132
119 3,749,133
177 3,749,134

CLASS 139
13 3,749,135
109 3,749,136
190 3,749,137
408 3,749,138
416 3,749,139

CLASS 140
71R 3,749,140

CLASS 141
5 3,749,141
73 3,749,142

CLASS 144
309AC 3,749,143

CLASS 148
1.5 3,749,610
6.15R 3,749,611
6.21 3,749,613
11.5F 3,749,612
188 3,749,614

CLASS 149
6 3,749,615
19 3,749,616

CLASS 151
69 3,749,144

CLASS 152
209R 3,749,145
210 3,749,146

CLASS 156
3 3,749,617
3,749,618
17 3,749,619
73 3,749,620
86 3,749,621
157 3,749,622
187 3,749,623
195 3,749,624
250 3,749,625
251 3,749,626
268 3,749,627
276 3,749,629
293 3,749,630
309 3,749,628
350 3,749,631
364 3,749,632
441 3,749,633
505 3,749,634
515 3,749,635

CLASS 160
80P 3,749,700
354 3,749,147

CLASS 161
37 3,749,636
184 3,749,637

CLASS 162
145 3,749,638

CLASS 164
33 3,749,148
50 3,749,149
87 3,749,150
260 3,749,151
283 3,749,152
295 3,749,153
306 3,749,154

CLASS 165
1 3,749,155
32 3,749,156
48 3,749,157
96 3,749,158
105 3,749,159
143 3,749,160
178 3,749,161

CLASS 166
.5 3,749,162
57 3,749,163
68 3,749,164
88 3,749,165
123 3,749,166
217 3,749,167
241 3,749,168
271 3,749,169
272 3,749,170
274 3,749,171
3,749,172
291 3,749,173
294 3,749,174

CLASS 169
31P 3,749,175
37 3,749,176

CLASS 172
44 3,749,177
225 3,749,178
297 3,749,179
801 3,749,180
803 3,749,181
804 3,749,182

CLASS 173
151 3,749,183

CLASS 174
15C 3,749,811
25R 3,749,812
42 3,749,813
47 3,749,814
66 3,749,815
70R 3,749,816
102SC 3,749,817
153G 3,749,818
158F 3,749,819
163F 3,749,820

CLASS 175
18 3,749,184
26 3,749,185
228 3,749,186
269 3,749,187
364 3,749,188
394 3,749,189
410 3,749,190

CLASS 176
3 3,749,639
78 3,749,640

CLASS 177
1 3,749,191

CLASS 178
5.2D 3,749,821
5.2 3,749,822
5.4CD 3,749,826
5.4HE 3,749,825
5.4R 3,749,823
3,749,824
6.6DD 3,749,827
6.6A 3,749,833
6.6B 3,749,828
6.8 3,749,829
3,749,830
3,749,831
22 3,749,832
66 3,749,834
69.5CB 3,749,835
69.5TV 3,749,836

CLASS 179
1J 3,749,837
2C 3,749,838
15AL 3,749,845
15BA 3,749,839
3,749,841
15BY 3,749,840
3,749,842
15A 3,749,843
18ES 3,749,844
84R 3,749,846
90D 3,749,847
99 3,749,848
100.2MD 3,749,852
100.2B 3,749,849
100.2C 3,749,850
100.2R 3,749,851
107H 3,749,853
110D 3,749,854
110F 3,749,855
170G 3,749,856
175.3 3,749,857

CLASS 180
6.5 3,749,192
9.48 3,749,193
54R 3,749,194
66F 3,749,195
85 3,749,196
98 3,749,197

CLASS 181
31B 3,749,198
38 3,749,199

CLASS 182
187 3,749,200

CLASS 187
9 3,749,201
12 3,749,202
29R 3,749,203
29 3,749,204

CLASS 188
1C 3,749,205
72.2 3,749,206
109 3,749,207
271 3,749,208
291 3,749,209
298 3,749,210

CLASS 190
49 3,749,211

CLASS 191
33AA 3,749,227
45R 3,749,858

CLASS 192
3T 3,749,212
48.8 3,749,213
53F 3,749,215
58B 3,749,214
70.14 3,749,216
113B 3,749,217

CLASS 194
2 3,749,218
4R 3,749,219
100A 3,749,220

CLASS 195
29 3,749,641
3,749,642
103.5R 3,749,643
3,749,644
3,749,645
117 3,749,646

CLASS 197
116 3,749,221
172 3,749,222
176 3,749,223

CLASS 198
16 3,749,224
31AA 3,749,225
33AD 3,749,226
140 3,749,228
177R 3,749,229

CLASS 200
5R 3,749,859
44 3,749,447
47 3,749,860
48A 3,749,861
50AA 3,749,862
61.45R 3,749,863
66PC 3,749,872
81.9M 3,749,864
81.9R Re.27,713
83R 3,749,865
85A 3,749,866
146R 3,749,867
148B 3,749,869
156 3,749,871
168G 3,749,870
168R 3,749,873

CLASS 201
9DN 3,749,450

CLASS 202
153 3,749,647

CLASS 203
41 3,749,648

CLASS 204
43S 3,749,649
44 3,749,650
56R 3,749,651
105R 3,749,652
129.4 3,749,653
129.65 3,749,654
180P 3,749,655
181 3,749,656
3,749,657
192 3,749,658
195T 3,749,659
243R 3,749,660
286 3,749,661
298 3,749,662

CLASS 206
1.5 3,749,230
5R 3,749,231
7G 3,749,232
16R 3,749,233
41.2B 3,749,234
45.31 3,749,235
45.34 3,749,236
57A 3,749,237
63.3 3,749,238

CLASS 208
110 3,749,663
253 3,749,665
254H 3,749,664
278 3,749,666

CLASS 209
74R 3,749,239
75 3,749,240
82 3,749,241
123 3,749,242

CLASS 210
36 3,749,667
37 3,749,668
104 3,749,243
169 3,749,244
180 3,749,245
199 3,749,246
205 3,749,247
238 3,749,248
268 3,749,249
448 3,749,250

CLASS 211
60T 3,749,252
126 3,749,251
171 3,749,253

CLASS 212
55 3,749,254

CLASS 213
8 3,749,255

CLASS 214
1Q 3,749,256
8.5A 3,749,257
17DB 3,749,259
17C 3,749,258
60 3,749,260
82 3,749,261
145 3,749,262
152 3,749,263
302 3,749,264
331 3,749,265
334 3,749,266
501 3,749,267
516 3,749,268
762 3,749,269

CLASS 215
9 3,749,270
32 3,749,271
40 3,749,272

CLASS 219
10.55 3,749,874
3,749,875
69C 3,749,876
69S 3,749,877
121L 3,749,878
210 3,749,879
214 3,749,880
352 3,749,881
390 3,749,882
463 3,749,883
501 3,749,884
522 3,749,885
528 3,749,886

CLASS 220
1.5 3,749,273
23.83 3,749,278
31S 3,749,274
48 3,749,275
60R 3,749,276
3,749,277

CLASS 221
7 3,749,279
67 3,749,280
298 3,749,281

CLASS 222
5 3,749,282
27 3,749,283
43 3,749,284
58 3,749,285
153 3,749,286
181 3,749,287
187 3,749,288
321 3,749,289
385 3,749,290
402.24 3,749,291

CLASS 223
57 3,749,292

CLASS 224
2B 3,749,293
5E 3,749,294
29R 3,749,295

CLASS 225
106 3,749,296

CLASS 226
199 3,749,297

CLASS 228
2 3,749,298

CLASS 229
15 3,749,299
37R 3,749,300
44R 3,749,301

CLASS 232
19 3,749,302

CLASS 233
20A 3,749,303
47R 3,749,304

CLASS 235
61.11C 3,749,888
61.11D 3,749,889
61.7B 3,749,887
92CP 3,749,890
94R 3,749,305
150.1 3,749,891
150.27 3,749,893
150.5 3,749,892
150.52 3,749,894
152 3,749,895
3,749,896
153AK 3,749,897
164 3,749,898
176 3,749,899

CLASS 236
47 3,749,306
48 3,749,307
93 3,749,308

CLASS 238
14 3,749,309
349 3,749,310

CLASS 239
17 3,749,311
33 3,749,312
102 3,749,318
127 3,749,313
206 3,749,314
224 3,749,315
265.13 3,749,316
265.19 3,749,317
318 3,749,319
416.1 3,749,320
669 3,749,321

CLASS 240
1.3 3,749,900
2 3,749,901
6.4W 3,749,902
10B 3,749,904
10.1 3,749,903
10.6CH 3,749,905
46.01 3,749,906
52R 3,749,907
78H 3,749,908

CLASS 241
24 3,749,322
28 3,749,323
58 3,749,324
86 3,749,325
136 3,749,326

CLASS 242
47.12 3,749,327
67.1 3,749,328
67.3R 3,749,330
75.51 3,749,329
3,749,331
198 3,748,988

CLASS 244
1SC 3,749,332
3.15 3,749,333
3.22 3,749,334
77B 3,749,335
134B 3,749,336
145 3,749,337
153R 3,749,338

CLASS 248
20 3,749,339
24 3,749,340
59 3,749,341
123 3,749,342
188 3,749,343
221 3,749,344
230 3,749,345
302 3,749,346
309 3,749,347
359 3,749,348
488 3,749,349

CLASS 249
106 3,749,350
170 3,749,351
180 3,749,352

CLASS 250
208 3,749,918
213VT 3,749,920
213R 3,749,919
214P 3,749,921
219D 3,749,922
223 3,749,923
227R 3,749,924
237G 3,749,925
251 3,749,909
271 3,749,916
273 3,749,910
303 3,749,913
305 3,749,926
323 3,749,912
325 3,749,927
336 3,749,915
347 3,749,928
369 3,749,929
394 3,749,914
430 3,749,917
482 3,749,911

CLASS 251
61.1 3,749,353
75 3,749,354

124 3,749,355
148 3,749,356
172 3,749,357
298 3,749,358
306 3,749,359
348 3,749,360

CLASS 252
8.57 3,749,669
47.5 3,749,695
62.1 3,749,670
89 3,749,671
95 3,749,672
3,749,673
3,749,674
135 3,749,675
3,749,676
187R 3,749,678
188.3CL 3,749,677
188.3 3,749,679
400A 3,749,680
438 3,749,681
524 3,749,682

CLASS 254
2R 3,749,361
29A 3,749,362
45 3,749,363
67 3,749,364
104 3,749,365
164 3,749,366
189 3,749,367

CLASS 256
11 3,749,368

CLASS 259
1R 3,749,369
10 3,749,370
72 3,749,371
77R 3,749,372
85 3,749,373
192 3,749,374
3,749,375

CLASS 260
2N 3,749,683
2.1E 3,749,684
2.5M 3,749,685
19A 3,749,686
23TN 3,749,687
28 3,749,688
29.6MH 3,749,692
29.6NR 3,749,689
29.6TA 3,749,690
29.6XA 3,749,691
41R 3,749,694
47ET 3,749,693
75R 3,749,696
3,749,697
78S 3,749,698
79.3R 3,749,699
80.72 3,749,701
97.5 3,749,702
112.5 3,749,703
3,749,704
3,749,705
3,749,706
117 3,749,707
156 3,749,708
211.5R 3,749,709
231A 3,749,710
239.1 3,749,711
239.55 3,749,712
240R 3,749,713
240.6 3,749,714
243R 3,749,715
3,749,717
244R 3,749,716
250A 3,749,718
3,749,720
250R 3,749,719
256.4C 3,749,723
256.4H 3,749,721
256.5R 3,749,724
268C 3,749,722
268R 3,749,725
279R 3,749,726
281 3,749,727
294.8B 3,749,729
294.8E 3,749,728
297R 3,749,730
306.8R 3,749,731
308A 3,749,732
308C 3,749,733
309.2 3,749,734
326N 3,749,735
327M 3,749,736
332.2A 3,749,739
332.3R 3,749,737
3,749,738
343.6 3,749,740
345.7 3,749,741
397.4 3,749,742
410.9R 3,749,744
410.9 3,749,743
413 3,749,745
453AR 3,749,746
454 3,749,747
455P 3,749,748
468R 3,749,749
470 3,749,750
482C 3,749,751
683.48 3,749,753
683.68 3,749,754
683.9 3,749,752
824 3,749,757
835 3,749,758
876R 3,749,755
878R 3,749,756

CLASS 261
18A 3,749,376
78A 3,749,378
78R 3,749,377
79A 3,749,379
98 3,749,380
111 3,749,381

CLASS 266
5A 3,749,383
6PC 3,749,384
23B 3,749,385
29 3,749,386
38 3,749,387
39 3,749,388

CLASS 267
52 3,749,389

CLASS 269
254 3,749,390
321F 3,749,391

CLASS 270
58 3,749,392
67 3,749,393
80 3,749,394

CLASS 271
4 3,749,395
5 3,749,396
70 3,749,397
86 3,749,398

CLASS 272
33A 3,749,399
83R 3,749,400

CLASS 273
95R 3,749,401
106R 3,749,402
106.5C 3,749,403
135B 3,749,404
153R 3,749,405
161 3,749,406
162E 3,749,407
171 3,749,408
183A 3,749,409

CLASS 274
4F 3,749,410

CLASS 277
2 3,749,411
81R 3,749,412

CLASS 280
11.2 3,749,413
47.19 3,749,414
96.1 3,749,415
3,749,416
104.5R 3,749,417
150AB 3,749,419
150SB 3,749,418
432 3,749,420
461A 3,749,421

CLASS 281
21 3,749,422
3,749,423

CLASS 285
161 3,749,424
191 3,749,425
336 3,749,426
382.2 3,749,427

CLASS 287
20.95 3,749,428
54A 3,749,429
58CT 3,749,430
90R 3,749,431
189.36A 3,749,432
189.36F 3,749,433

CLASS 292
128 3,749,434
341.16 3,749,435

CLASS 293
73 3,749,436

CLASS 294
67AA 3,749,437
81SF 3,749,438

CLASS 296
26 3,749,439
51 3,749,440

CLASS 297
223 3,749,441
312 3,749,442
362 3,749,443
445 3,749,444

CLASS 298
26 3,749,445

CLASS 299
37 3,749,446
62 3,749,448
93 3,749,449

CLASS 303
6C 3,749,451
22R 3,749,452
67 3,749,453

CLASS 307
10AT 3,749,930
3,749,931
112 3,749,932
116 3,749,933
117 3,749,934
149 3,749,935
202 3,749,936
225C 3,749,937
227 3,749,938
232 3,749,939
235R 3,749,944
247A 3,749,940
253 3,749,945
271 3,749,941
3,749,942
311 3,749,943

CLASS 308
3.9 3,749,454
6R 3,749,455
9 3,749,456
36.1 3,749,464
58 3,749,457
142 3,749,458
187 3,749,459
196 3,749,460
201 3,749,461
228 3,749,462
236 3,749,463

CLASS 310
8.1 3,749,946
8.3 3,749,947
9.4 3,749,948
45 3,749,950
54 3,749,952
59 3,749,949
62 3,749,953
73 3,749,951
90 3,749,954
93 3,749,955
216 3,749,956
265 3,749,957

CLASS 312
241 3,749,466
245 3,749,465

CLASS 313
146 3,749,958
188 3,749,959
318 3,749,960

CLASS 315
3 3,749,961
18 3,749,963
3,749,964
22 3,749,965
27TD 3,749,966
35 3,749,962
85 3,749,967
95 3,749,968
169TV 3,749,969
3,749,971
3,749,972
169 3,749,970
209T 3,749,974
209 3,749,973
236 3,749,978
241R 3,749,975
3,749,976
276 3,749,977

CLASS 316
19 3,749,467
30 3,749,468

CLASS 317
16 3,749,979
98 3,749,980
100 3,749,981
120 3,749,982
234R 3,749,983
235R 3,749,984
3,749,985
3,749,987
249R 3,749,986

CLASS 318
6 3,749,988
3,749,989
166 3,749,990
254 3,749,991
452 3,749,992
563 3,749,993
3,749,994
570 3,749,995
571 3,749,996
592 3,749,997
669 3,749,999
696 3,750,000

CLASS 320
61 3,750,001
3,750,002

CLASS 321
12 3,750,003
14 3,750,004
18 3,750,005

CLASS 322
28 3,750,006

CLASS 323
19 3,750,007

CLASS 324
.5R 3,750,008
1 3,750,009
29.5 3,750,011
34D 3,750,010
52 3,750,012
57R 3,750,016
58 3,750,013
72 3,750,017
72.5 3,750,015
79D 3,750,014
158T 3,750,018
178 3,750,019

CLASS 325
5 3,750,020
38A 3,750,021
38B 3,750,024
53 3,750,022
105 3,750,023
321 3,750,025
3,750,026
349 3,750,027
418 3,750,028
420 3,750,029
422 3,750,030
452 3,750,031
470 3,750,032
478 3,750,033

CLASS 328
110 3,750,034
133 3,750,035
151 3,750,036
167 3,750,037

CLASS 330
11 3,750,038
13 3,750,039
24 3,750,040
26 3,750,041
29 3,750,042
43 3,750,043
126 3,750,044

CLASS 331
94.005 3,750,047
94.5C 3,750,045
94.5D 3,750,050
94.5H 3,750,046
94.5 3,750,048
3,750,049

CLASS 332
9R 3,750,051

CLASS 333
7 3,750,053
28R 3,750,052
29 3,750,054
31R 3,750,055
72 3,750,056
76 3,750,057
95R 3,750,058

CLASS 335
135 3,750,060
142 3,750,059
168 3,750,061
206 3,750,062
3,750,063
208 3,750,064
272 3,750,065
274 3,750,066
296 3,750,067
306 3,750,068

CLASS 336
83 3,750,069
84 3,750,070
3,750,071
185 3,750,072
198 3,750,073

CLASS 337
77 3,750,074
158 3,750,075
348 3,750,076

CLASS 338
32R 3,750,077
150 3,750,078
172 3,750,080
174 3,750,081
220 3,750,082

CLASS 339
12R 3,750,083
61R 3,750,084
75M 3,750,085
3,750,086
90R 3,750,087
94A 3,750,088
97R 3,750,089
130C 3,750,090
176M 3,750,091
192RL 3,750,092
205 3,750,093
217R 3,750,094

CLASS 340
3C 3,750,095
3R 3,750,152
5R 3,750,096
12R 3,750,097
18CM 3,750,098
22 3,750,099
52B 3,750,101
52E 3,750,102
52H 3,750,100
153R 3,750,103
172.5 3,750,104
3,750,105
3,750,106
3,750,107
3,750,108
3,750,109
3,750,110
3,750,111
3,750,112
173AM 3,750,115
173BB 3,750,116
173LS 3,750,114
3,750,117
173SP 3,750,113
173.1 3,750,153
174MA 3,750,118
174SC 3,750,119
174TF 3,750,154
174.1G 3,750,121
174.1K 3,750,120
183 3,750,155
196 3,750,122
203 3,750,156
227R 3,750,157
237R 3,750,123
244E 3,750,124
258C 3,750,125
3,750,126
261 3,750,127
263 3,750,128
267C 3,750,130
267R 3,750,129
272 3,750,158
277 3,750,131
309.1 3,750,132
324AD 3,750,133
3,750,135
324A 3,750,134
324M 3,750,159
324R 3,750,136
330 3,750,137
334 3,750,138
336 3,750,139
3,750,140
347AD 3,750,143
3,750,146
347CC 3,750,142
347DA 3,750,141
347DD 3,750,144
3,750,145
3,750,147
351 3,750,148
365C 3,750,149
365E 3,750,160
365P 3,750,150
379 3,750,151
418 3,750,161

CLASS 343
5PD 3,750,162
3,750,165
5R 3,750,164
6TV 3,750,166
6.5SS 3,750,167
6.5R 3,750,163
3,750,168
7ED 3,750,169
8 3,750,170
9 3,750,171
12R 3,750,172
17.7 3,750,173
18E 3,750,174
1005A 3,750,175
107 3,750,176
108R 3,750,177
112R 3,750,178
112 3,750,188
175 3,750,179
783 3,750,182
786 3,750,183
788 3,750,180
790 3,750,181
792 3,750,184
814 3,750,185

CLASS 346
1 3,750,186
23 3,749,868
49 3,750,187
74ES 3,749,189
3,750,190
75 3,750,191

CLASS 350
3.5 3,749,469
3,749,470
109 3,749,471
121 3,749,472
156 3,749,473
160LC 3,749,474
160R 3,749,475
161 3,749,476
181 3,749,477
216 3,749,478
252 3,749,479
289 3,749,480

CLASS 351
14 3,749,481

CLASS 352
80 3,749,482

CLASS 353
15 3,749,483
30 3,749,484
62 3,749,485
120 3,749,486

CLASS 355
1 3,749,487
3 3,749,488
52 3,749,489
89 3,749,490
106 3,749,491

CLASS 356
2 3,749,492
3,749,493
16 3,749,494
51 3,749,495
73 3,749,496
93 3,749,497
101 3,749,498
150 3,749,499
156 3,749,500
169 3,749,501

CLASS 383
164 3,750,079

CLASS 401
139 3,749,502
195 3,749,503

CLASS 404
84 3,749,504
98 3,749,505
133 3,749,506

CLASS 408
46 3,749,507
156 3,749,508
234 3,749,509

CLASS 415
103 3,749,510
113 3,749,511
136 3,749,512
152 3,749,513

CLASS 416
95 3,749,514
143 3,749,515
183 3,749,520
199 3,749,516
226 3,749,517
230 3,749,518
241 3,749,519

CLASS 417
53 3,749,521
54 3,749,522
269 3,749,523
318 3,749,525
323 3,749,524
390 3,749,526
395 3,749,527
424 3,749,528
437 3,749,529

CLASS 418
45 3,749,531
137 3,749,532

CLASS 423
278 3,749,792
332 3,749,759
446 3,749,760
562 3,749,761
574 3,749,762
608 3,749,763
610 3,749,764

CLASS 424
48 3,749,766
54 3,749,767
59 3,749,768
61 3,749,769
72 3,749,770
78 3,749,771
81 3,749,772
3,749,773
177 3,749,774

CLASSIFICATION OF PATENTS

200	3,749,775	256	3,749,785		3,749,793	CLASS 425		313	3,749,539	5	3,749,546
203	3,749,776	262	3,749,784		3,749,794			326	3,749,540	95	3,749,547
204	3,749,777	267	3,749,786	301	3,749,795	73	3,749,533		3,749,541	158	3,749,548
241	3,749,778	270	3,749,787	304	3,749,796	92	3,749,534	388	3,749,542	CLASS 432	
244	3,749,780		3,749,788	308	3,749,797	150	3,749,535	393	3,749,543		
251	3,749,765	273	3,749,779	318	3,749,800	190	3,749,536	397	3,749,544	49	3,749,549
	3,749,781		3,749,789	342	3,749,798	242	3,749,537	CLASS 431		58	3,749,382
	3,749,782	274	3,749,790	344	3,749,799	261	3,749,530			122	3,749,550
	3,749,783	278	3,749,791	346	3,749,801		3,749,538	2	3,749,545	222	3,749,551

CLASSIFICATION OF DESIGNS

D 2—	415	227,947	113	227,965		227,984		227,998		16	228,015	D71—	1 228,031
D 4—	21	227,948	150	227,964	6	227,980	D34—	2 227,999	D48—	24	228,016		228,032
		227,949	177	227,966		227,981		4 228,000			228,017	D74—	17 228,033
D 6—	22	227,950		227,967		227,983		228,001	D52—	6	228,018	D83—	1 228,034
	24	227,951	185	227,968	D22— 27	227,985		5 228,002		7	228,019		228,035
	26	227,952	192	227,969	D23— 139	227,986		228,003			228,020	D85—	2 228,036
	30	227,953	242	227,970	162	227,987		228,004	D55—	1	228,021		228,037
	42	227,954	D 7— 48	227,971	D26— 1	227,988		15 228,005			228,022		228,038
	47	227,955	D 8— 36	227,972		227,989		228,006			228,024		228,039
	66	227,956	147	227,973		227,990	D35—	3 228,007	D56—		228,023	D86—	10 228,040
	69	227,957	179	227,974	5	227,991	D40—	1 228,008		4	228,025		228,041
		227,958	220	227,975		227,992		228,009	D57—	1	228,026		228,042
	75	227,959	266	227,976		227,993		228,010			228,027	D87—	1 228,043
	78	227,960	D 9— 184	227,977		227,994		228,011			228,028		228,044
		227,961	194	227,978		227,995	D45—	4 228,012	D61—		228,029	D90—	20 228,045
		227,962	231	227,979	13	227,996		228,013	D64—	11	228,030		228,046
	97	227,963	D13— 1	227,982	14	227,997		228,014					

CLASSIFICATION OF PLANTS

P. —	20	3,381	P. —	3,382	P. —	29	3,383	P. —	56	3,384	P. —	74	3,379	P. —	76	3,378
P. —	25	3,380														

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,748,673
3,748,735
3,748,860
3,748,999
3,749,085
3,749,334
3,749,414
3,749,911
3,749,915
3,749,935
4 : 3,748,697
3,748,961
3,749,243
3,749,406
3,749,837
3,750,041
3,750,142
3,750,161
6 : 3,748,658
3,748,659
3,748,661
3,748,676
3,748,683
3,748,696
3,748,699
3,748,716
3,748,749
3,748,755
3,748,765
3,748,767
3,748,775
3,748,779
3,748,785
3,748,790
3,748,798
3,748,800
3,748,809
3,748,813
3,748,832
3,748,838
3,748,876
3,748,878
3,748,891
3,748,899
3,748,901
3,748,909
3,748,927
3,748,933
3,748,945
3,748,950
3,748,953
3,748,954
3,748,963
3,748,992
3,748,998
3,749,000
3,749,002
3,749,024
3,749,035
3,749,041
3,749,043
3,749,058
3,749,089
3,749,097
3,749,103
3,749,104
3,749,123
3,749,131
3,749,133
3,749,138
3,749,144
3,749,187
3,749,192
3,749,203
3,749,221
3,749,225
3,749,258
3,749,281
3,749,284
3,749,289
3,749,291
3,749,293
3,749,294
3,749,300
3,749,311
3,749,314
3,749,316
3,749,317
3,749,324
3,749,333
3,749,346
3,749,347
3,749,361
3,749,364
3,749,377
3,749,381
3,749,402
3,749,404
3,749,405
3,749,422
3,749,423
3,749,424
3,749,435
3,749,438
3,749,442
3,749,446
3,749,450
3,749,456
3,749,472
3,749,477
3,749,479
3,749,484
3,749,486
3,749,491
3,749,493
3,749,525
3,749,553
3,749,554
3,749,556
3,749,584
3,749,594
3,749,601
3,749,603
3,749,608
3,749,613
3,749,626
3,749,627
3,749,636
3,749,643
3,749,644
3,749,645
3,749,663
3,749,664
3,749,665
3,749,695
3,749,700
3,749,713
3,749,730
3,749,736
3,749,743
3,749,744
3,749,747
3,749,748
3,749,764
3,749,775
3,749,792
3,749,808
3,749,822
3,749,882
3,749,893
3,749,894
3,749,898
3,749,901
3,749,904
3,749,909
3,749,913
3,749,914
3,749,923
3,749,942
3,749,961
3,749,968
3,749,978
3,750,001
3,750,003
3,750,016
3,750,019
3,750,021
3,750,022
3,750,035
3,750,037
3,750,047
3,750,049
3,750,061
3,750,067
3,750,078
3,750,086
3,750,089
3,750,090
3,750,099
3,750,109
3,750,112
3,750,113
3,750,119
3,750,127
3,750,128
3,750,131
3,750,137
3,750,138
3,750,139
3,750,147
3,750,151
3,750,163
3,750,166
3,750,167
3,750,173
3,750,189
8 : 3,748,681
3,749,077
3,749,169
3,749,170
3,749,202
3,749,205
3,749,413
3,749,848
3,749,859
3,749,899
3,749,925
3,749,965
3,749,993
3,750,017
9 : 3,748,693
3,748,736
3,748,741
3,748,744
3,748,835
3,748,842
3,748,897
3,748,964
3,748,972
3,749,013
3,749,072
3,749,115
3,749,127
3,749,132
3,749,152
3,749,233
3,749,242
3,749,283
3,749,296
3,749,301
3,749,322
3,749,461
3,749,517
3,749,518
3,749,524
3,749,620
3,749,654
3,749,838
3,749,864
3,749,919
3,749,995
3,750,164
10 : 3,748,730
3,749,621
3,749,637
3,749,926
12 : 3,748,669
3,748,727
3,748,729
3,748,751
3,748,757
3,748,782
3,748,808
3,748,982
3,748,985
3,749,090
3,749,101
3,749,121
3,749,246
3,749,280
3,749,287
3,749,337
3,749,391
3,749,514
3,749,532
3,749,610
3,749,678
3,749,831
3,749,992
3,750,005
3,750,169
3,750,176
13 : 3,748,821
3,750,071
15 : 3,748,733
3,748,983
3,749,046
3,749,887
17 : Re.27,713
3,748,711
3,748,719
3,748,743
3,748,759
3,748,766
3,748,780
3,748,783
3,748,806
3,748,822
3,748,834
3,748,837
3,748,865
3,748,881
3,748,889
3,748,895
3,748,923
3,748,928
3,748,944
3,748,962
3,748,969
3,749,005
3,749,049
3,749,108
3,749,142
3,749,182
3,749,201
3,749,207

3,749,211
3,749,223
3,749,229
3,749,230
3,749,268
3,749,272
3,749,306
3,749,343
3,749,387
3,749,394
3,749,407
3,749,410
3,749,433
3,749,465
3,749,488
3,749,505
3,749,523
3,749,527
3,749,542
3,749,551
3,749,570
3,749,579
3,749,592
3,749,593
3,749,653
3,749,670
3,749,681
3,749,687
3,749,752
3,749,765
3,749,777
3,749,782
3,749,783
3,749,796
3,749,805
3,749,825
3,749,846
3,749,853
3,749,855
3,749,856
3,749,862
3,749,871
3,749,903
3,749,930
3,749,945
3,749,954
3,749,972
3,749,982
3,750,032
3,750,056
3,750,068
3,750,069
3,750,076
3,750,091
3,750,092
3,750,094
3,750,111
3,750,114
3,750,156
18 : 3,748,674
3,748,708
3,748,793
3,748,924
3,748,931
3,749,179
3,749,198
3,749,365
3,749,439
3,749,520
3,749,602
3,749,647
3,749,648
3,749,770
3,749,784
3,749,797
3,749,960
3,749,966
3,749,980
3,750,044
3,750,081
3,750,148
19 : 3,748,772
3,748,818
3,749,403
3,749,482
3,749,815
3,749,897
3,750,177
20 : 3,748,810
3,749,084
3,749,180
3,749,356
3,749,372
3,749,382
3,749,430
3,749,566
21 : 3,748,774
3,748,976
3,749,037
3,749,081
3,749,237
3,749,388
3,749,507
3,749,661
3,749,849
3,749,875

22 : 3,748,682
3,748,852
3,749,088
3,749,126
3,749,426
3,749,552
3,749,754
23 : 3,749,042
24 : 3,748,787
3,748,939
3,749,017
3,749,156
3,749,191
3,749,239
3,749,362
3,749,616
3,749,873
3,749,905
3,750,179
3,750,185
25 : 3,748,739
3,748,761
3,748,833
3,748,912
3,748,934
3,748,966
3,748,980
3,748,984
3,748,987
3,748,988
3,748,990
3,748,994
3,749,053
3,749,176
3,749,219
3,749,256
3,749,273
3,749,276
3,749,285
3,749,302
3,749,348
3,749,411
3,749,412
3,749,489
3,749,544
3,749,607
3,749,623
3,749,874
3,749,895
3,749,963
3,749,967
3,750,007
3,750,013
3,750,025
3,750,048
3,750,088
3,750,118
3,750,121
3,750,125
3,750,126
3,750,134
3,750,140
3,750,143
3,750,146
3,750,158
3,750,182
26 : Re.27,712
3,748,679
3,748,738
3,748,746
3,748,791
3,748,836
3,748,839
3,748,851
3,748,921
3,748,922
3,748,929
3,748,941
3,749,012
3,749,027
3,749,045
3,749,065
3,749,068
3,749,071
3,749,076
3,749,110
3,749,128
3,749,157
3,749,165
3,749,194
3,749,206
3,749,214
3,749,226
3,749,252
3,749,269
3,749,288
3,749,409
3,749,418
3,749,440
3,749,451
3,749,475
3,749,485
3,749,487
3,749,492
3,749,513

3,749,531
3,749,560
3,749,587
3,749,599
3,749,600
3,749,625
3,749,649
3,749,683
3,749,733
3,749,800
3,749,810
3,749,819
3,749,823
3,749,863
3,749,877
3,749,918
3,749,974
3,749,981
3,750,104
3,750,124
3,750,171
3,750,172
3,750,187
27 : Re.27,714
3,748,660
3,748,754
3,748,777
3,748,820
3,748,840
3,748,900
3,748,919
3,749,008
3,749,010
3,749,022
3,749,032
3,749,129
3,749,184
3,749,195
3,749,535
3,749,675
3,749,820
3,749,934
3,750,083
3,750,087
28 : 3,749,164
29 : 3,748,714
3,748,792
3,748,997
3,749,087
3,749,120
3,749,161
3,749,196
3,749,277
3,749,470
3,749,496
3,749,559
3,749,586
3,749,617
3,749,618
3,749,655
3,749,676
3,749,814
3,750,011
3,750,075
30 : 3,749,499
31 : 3,749,075
3,749,117
3,749,147
3,749,425
3,749,886
3,749,907
32 : 3,749,007
33 : 3,748,904
3,749,315
3,749,335
3,749,454
3,749,763
3,749,932
3,750,039
34 : 3,748,734
3,748,737
3,748,748
3,748,812
3,748,845
3,748,864
3,748,879
3,748,882
3,748,916
3,748,975
3,749,016
3,749,039
3,749,066
3,749,093
3,749,099
3,749,100
3,749,113
3,749,204
3,749,218
3,749,231
3,749,244
3,749,249
3,749,271
3,749,274
3,749,286
3,749,312
3,749,328

3,749,344
3,749,366
3,749,369
3,749,393
3,749,434
3,749,467
3,749,469
3,749,502
3,749,503
3,749,547
3,749,569
3,749,590
3,749,597
3,749,614
3,749,631
3,749,633
3,749,658
3,749,666
3,749,677
3,749,679
3,749,680
3,749,690
3,749,717
3,749,718
3,749,731
3,749,734
3,749,758
3,749,767
3,749,773
3,749,781
3,749,789
3,749,791
3,749,793
3,749,794
3,749,799
3,749,818
3,749,829
3,749,843
3,749,845
3,749,896
3,749,902
3,749,916
3,749,933
3,749,938
3,749,984
3,749,997
3,750,014
3,750,024
3,750,038
3,750,045
3,750,046
3,750,051
3,750,058
3,750,079
3,750,103
3,750,106
3,750,108
3,750,133
3,750,145
3,750,149
3,750,153
3,750,154
3,750,178
35 : 3,749,141
3,749,737
3,749,738
3,749,739
36 : Re.27,715
3,748,668
3,748,678
3,748,688
3,748,692
3,748,706
3,748,710
3,748,715
3,748,728
3,748,750
3,748,753
3,748,769
3,748,804
3,748,815
3,748,817
3,748,830
3,748,855
3,748,896
3,748,907
3,748,917
3,748,936
3,748,974
3,748,991
3,749,006
3,749,029
3,749,048
3,749,056
3,749,064
3,749,086
3,749,118
3,749,130
3,749,197
3,749,217
3,749,234
3,749,253
3,749,255
3,749,282
3,749,290
3,749,318

3,749,349
3,749,379
3,749,383
3,749,390
3,749,397
3,749,401
3,749,417
3,749,476
3,749,480
3,749,481
3,749,494
3,749,500
3,749,572
3,749,577
3,749,582
3,749,612
3,749,632
3,749,640
3,749,652
3,749,659
3,749,662
3,749,686
3,749,693
3,749,697
3,749,699
3,749,722
3,749,735
3,749,776
3,749,780
3,749,798
3,749,833
3,749,841
3,749,889
3,749,920
3,749,950
3,749,953
3,749,985
3,749,987
3,749,999
3,750,015
3,750,018
3,750,030
3,750,034
3,750,042
3,750,053
3,750,115
3,750,117
3,750,132
3,750,152
3,750,157
3,750,174
3,750,181
3,750,184
37 : 3,748,773
3,748,843
3,748,844
3,748,870
3,748,905
3,748,943
3,749,003
3,749,222
3,749,360
3,749,504
3,749,549
3,749,751
3,749,802
3,749,803
3,749,830
3,749,880
3,750,004
38 : 3,749,342
39 : 3,748,721
3,748,722
3,748,778
3,748,816
3,748,841
3,748,850
3,748,853
3,748,868
3,748,886
3,748,888
3,748,892
3,748,951
3,749,015
3,749,051
3,749,057
3,749,078
3,749,094
3,749,105
3,749,122
3,749,146
3,749,148
3,749,151
3,749,175
3,749,261
3,749,264
3,749,295
3,749,308
3,749,332
3,749,336
3,749,353
3,749,380
3,749,386
3,749,399
3,749,408
3,749,415

3,749,436
3,749,449
3,749,460
3,749,473
3,749,474
3,749,501
3,749,545
3,749,588
3,749,591
3,749,630
3,749,671
3,749,673
3,749,674
3,749,692
3,749,696
3,749,702
3,749,745
3,749,766
3,749,772
3,749,813
3,749,816
3,749,870
3,749,876
3,749,929
3,749,941
3,749,944
3,749,956
3,749,959
3,749,970
3,749,971
3,750,000
3,750,010
3,750,050
3,750,065
3,750,120
3,750,130
3,750,159
40 : 3,749,171
3,749,172
3,749,173
3,749,177
3,749,232
3,749,247
3,749,266
3,749,546
3,749,548
3,749,589
3,749,762
41 : 3,748,740
3,748,768
3,748,942
3,749,030
3,749,031
3,749,063
3,749,178
3,749,323
42 : 3,748,657
3,748,677
3,748,712
3,748,732
3,748,758
3,748,770
3,748,794
3,748,807
3,748,814
3,748,825
3,748,829
3,748,893
3,748,902
3,748,906
3,748,932
3,749,021
3,749,073
3,749,080
3,749,109
3,749,116
3,749,190
3,749,245
3,749,265
3,749,275
3,749,279
3,749,329
3,749,331
3,749,339
3,749,350
3,749,354
3,749,355
3,749,359
3,749,371
3,749,400
3,749,428
3,749,453
3,749,463
3,749,512
3,749,516
3,749,533
3,749,550
3,749,604
3,749,651
3,749,657
3,749,668
3,749,669
3,749,672
3,749,684
3,749,688
3,749,725

3,749,728
3,749,740
3,749,741
3,749,750
3,749,779
3,749,861
3,749,866
3,749,867
3,749,883
3,749,888
3,749,900
3,749,906
3,749,917
3,749,979
3,749,988
3,749,989
3,749,994
3,750,040
3,750,057
3,750,059
3,750,070
3,750,084
3,750,107
44 : 3,748,874
3,749,001

3,749,055
3,749,236
3,749,638
3,749,757
3,749,879
45 : 3,749,136
3,749,200
3,749,340
3,750,012
47 : 3,749,082
3,749,083
3,749,212
3,749,539
3,749,624
3,749,801
48 : 3,748,687
3,748,691
3,748,702
3,748,705
3,748,718
3,748,776
3,748,811
3,748,863
3,748,884

3,748,890
3,748,894
3,748,918
3,749,092
3,749,119
3,749,162
3,749,166
3,749,167
3,749,168
3,749,174
3,749,183
3,749,188
3,749,250
3,749,299
3,749,338
3,749,357
3,749,420
3,749,421
3,749,429
3,749,506
3,749,515
3,749,521
3,749,529
3,749,557
3,749,585

3,749,753
3,749,936
3,749,948
3,750,009
3,750,027
3,750,096
3,750,097
3,750,098
3,750,123
3,750,175
49 : 3,748,742
3,749,358
3,749,615
3,750,162
50 : 3,748,957
3,748,958
3,749,052
3,750,116
51 : 3,749,019
3,749,240
3,749,368
3,749,464
3,749,495
3,749,629

3,749,685
3,749,962
3,749,973
3,750,168
53 : 3,748,672
3,748,675
3,748,680
3,748,797
3,748,947
3,748,948
3,749,061
3,749,163
3,749,227
3,749,248
3,749,376
3,749,437
3,749,543
54 : 3,749,611
3,749,761
3,749,771
55 : Re.27,711
3,748,717
3,748,795
3,748,887

3,748,908
3,748,915
3,748,946
3,748,977
3,749,004
3,749,054
3,749,069
3,749,134
3,749,216
3,749,254
3,749,259
3,749,309
3,749,341
3,749,351
3,749,605
3,749,691
3,749,715
3,749,795
3,749,860
3,749,924
3,749,943
3,749,951
3,749,975
3,750,155
3,750,165

Design Patents

4 : 227,986
228,037
228,038
228,039
6 : 227,955
227,963
227,965
227,975
227,987
227,999
228,027
228,032
228,033
228,043
9 : 228,004

228,019
228,020
228,040
228,041
16 : 227,974
17 : 227,951
227,952
227,957
227,972
227,976
18 : 227,954
227,958
227,989
19 : 228,018
228,022

20 : 228,010
228,011
22 : 227,981
227,983
228,021
25 : 227,996
228,026
228,028
228,042
26 : 227,953
227,956
227,964
227,995
228,024
228,025

228,045
27 : 228,008
228,009
34 : 227,967
227,971
228,005
36 : 227,970
227,973
227,978
227,982
227,984
227,988
227,994
228,000

228,001
228,002
228,016
228,017
228,023
228,029
228,030
228,036
37 : 227,959
227,969
39 : 227,992
227,997
228,003
228,006

228,046
42 : 227,947
227,990
228,034
44 : 227,948
227,949
228,012
228,013
228,014
228,015
47 : 227,985
48 : 227,977
228,007
49 : 227,979

Plant Patents

6 : 3,384	17 : 3,379	41 : 3,381			

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary